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JOURNAL
of the
Association of American Medical Colleges

Volume 22 MAY, 1947 Number 3

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Published bimonthly, January, March, May, July, September and November, at 5 South Wabash Avenue, Chicago 3, Illinois, by the Association of American Medical Colleges. Subscription price $4.00 per year. Single copies, $1.00.

Entered as second class matter January 17, 1930, at the Post Office at Chicago, Illinois, under the Act of March 3, 1879.

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THE WILLIAMS & WILKINS COMPANY

Publishers of William Wood Books, Baltimore 2, Md.

JOURNAL
OF THE
Association *of* American Medical Colleges

Volume 22 MAY, 1947 Number 3

Report of the Committee on Audiovisual Aids*

W. A. BLOEDORN, Chairman
George Washington University
JOE E. MARKEE
Duke University
and
ROBT. P. WALTON
Medical College of the State of South Carolina

The Committee held its first meeting on January 3, 1947, at Washington, D. C., at which time a tentative program was outlined for coordinating efforts of the various medical schools in this important field of medical education. Later the same day the committee met with the Inter-Departmental Committee composed of representatives of the War Department, Navy Department, Veterans Administration and United States Public Health Service. At this meeting the opinion was expressed that these two committees could well coordinate their resources and advance the program more rapidly and effectively than they could do separately.

After considerable discussion the meeting adjourned with the idea that subsequent meetings would be held to further this project.

The Inter-Departmental Committee shortly thereafter agreed on a plan for joint development of audiovisual aids with the committee of the Association of American Medical Colleges. The outline of this plan is appended hereto and indicates a desire for active cooperation with the committee of the Association of American Medical Colleges. The advantages of such a cooperative plan are apparent. The Inter-Departmental Committee, in brief, proposes to place at the disposal of the Association of American Medical Colleges its combined resources and the Association of American Medical Colleges would, in return, provide the personnel required to establish and maintain a Medical Film Institute and the professional subject matter specialists from the faculties of the medical schools. The resources of the Inter-Departmental Committee are considerable. Their combined budget is in excess of $3,000,000 annually for the production of audiovisual aids. In addition to this item, their investment in production facilities, equipment and plants is in excess of $20,000,000.

* Authorized by the Executive Council of the Association of American Medical Colleges.

It is proposed to establish a Medical Film Institute at some central point which would serve as the coördinating agency in carrying on this work. The primary function of the Medical Film Institute is the development of a good pattern for curriculum integrated audiovisual aids. As indicated in the report of the Inter-Departmental Committee, any film requested by a medical school, which finds a common area of acceptance in the curriculum of medical schools and the services represented by the Inter-Departmental Committee, will be produced by the facilities of the four governmental agencies without cost to the medical school.

Films not falling in this category may be produced as heretofore under the private auspices of the requesting school. In the planning stage of such films, the Medical Film Institute will render every possible service except production.

Our committee feels that a great majority of audiovisual aids proposed by individual medical schools, will be found acceptable under this plan.

The Medical Film Institute would be charged with the duty of examining all available audiovisual aids for medical education that exist at the present time and would list not only titles, but a description of content and an analysis of the educational value of each listing. This catalogue of available audiovisual aids would be supplied to each medical school. Copies of films produced under the auspices of the Medical Film Institute will be made available to medical schools at approximately cost price.

Your committee has contacted many faculty members of medical schools who have already produced films in their respective fields, many of which have great educational value and asked for opinions regarding the above outline.

The replies have been universally enthusiastic and it was felt from the sample the committee obtained, that the personnel of faculties of medical schools would find the proposed Medical Film Institute a most valuable aid in their teaching program. Many medical educators have specific ideas for proposed film aids they felt would be of great value in their own teaching program and which they believe would be used by a considerable number of medical schools. Specific examples where film aids could be made for teaching have been collected. Your committee did not have time to cover every field of medical education, but samples were taken from both preclinical and clinical branches of medicine and there is universal interest in all departments of medicine in the use of audiovisual aids in teaching.

The committee is convinced that medical teaching can be made substantially more effective by the active prosecution of an expanded program for producing improved audiovisual teaching aids. Joint efforts of medical school teaching staffs and expert production specialists using the best technical facilities can be expected to achieve results of a distinctly superior quality to that obtained in the previous use of these methods. Such productions can be expected to make significant contributions to efficient teaching.

Audiovisual aids should improve medical teaching by:

(1) Transmitting concepts of dynamic phenomena with greater clarity and better prospect of retention and subsequent application.

(2) Substantially broadening the experience of students by increased opportunities for presenting both specialized laboratory experiments and diversified clinical material.

(3) Shortening the time for introducing and demonstrating essentially practical technics, with corresponding improvement in performance.

(4) Permitting greater specialization in teaching and stimulating more imaginative instructional activity, since such a program has the effect of pooling the best efforts of a large group of experienced medical teachers. These media provide instructors with a superior opportunity for studying and profiting from the teaching methods of others.

(5) Facilitating the rapid dissemination of information by providing another, more versatile medium of presentation. Authoritative lectures on rapidly changing subjects as therapeutics, for instance, can be revised frequently and quickly distributed through the use of film strip and correlated phonograph discs.

(6) Improving particularly the educational opportunities in colleges with relatively limited resources and thus tending to lessen the disparities of training which may exist between institutions with widely varying resources.

The following examples are listed even though creditable audiovisual material is already available for many of these topics:

ANATOMY.—Gross anatomy dissection can be presented with special utilization of telephoto lenses providing frequent transitions from gross to magnified fields of vision. Color photography taken during surgical operations or on relatively fresh cadavers can provide experience under true color conditions. Three dimensional, stereoscopic technics may also contribute to effectiveness. Viewing such prosections has been found to accelerate the student's dissection rate with an improvement in acquired knowledge.

Embryological developmental patterns can be followed continuously with animated moving pictures and thus provide a superior grasp of the process over that obtained by studying still sections. The actual photography of the growing embryo is successfully presented by time-lapse technics.

In histology, many colored lantern slides and three dimensional diagrams are already in use in medical schools. A great deal of this material might advantageously be transferred to film strips and separate sound track on records or sound tape and would result in a more concise and rapid presentation. The functional aspects of histology could be presented better on motion picture films showing the activities of living cells and tissues. Portions of some of the existing films of this type are excellent. These portions might profitably be combined and supplied with a separate sound track.

In neuroanatomy, film strips might be made of one or more of the series of consecutive sections of the brain already illustrated in a number of neuroanatomy textbooks. A number of different sound recordings on records or sound tape could be supplied for each film strip. Thus, the course of the corticospinal tract might be described on one sound recording and the course of the spinal thalamic tract on a second sound recording and both used with the same film

strip. The accomplishment of this same end through motion picture photography of serial sections of the brain would be a great deal more expensive. A number of motion pictures demonstrating the effect of lesions of the central nervous system are already in general use in the teaching of neuroanatomy. The effectiveness of these cinemas could be increased by deleting the less satisfactory material and substituting separate sound tracks for the time consuming legends.

Surgical anatomy could be presented most advantageously through the combined use of film strips and motion pictures with accompanying sound recordings. The appropriate diagrams and drawings can best be on film strips and the cadaver dissections depicting the relations, landmarks and danger points can best be demonstrated by the cinema. The surgical anatomy pertinent to a particular operative procedure should be presented as an entity but it should be so planned that it could be used in conjunction with a motion picture of that same operative procedure.

BIOCHEMISTRY.—Biochemical processes can be presented through animated diagrams using the experience which has already been gained in the application of this method in pure chemistry. Osmosis, contact catalysis, mass-action laws, steroisomerism phenomena, and metabolic transitions are capable of presentation by this method.

Moving picture presentations of nutritional deficiencies in both animals and patients can be used to advantage in showing abnormal gaits, tendon reflexes, etc. Endocrine disturbances as clinical entities fall in the same category.

Technics of colorimetry, Van Slyke manometric and volumetric determinations, could be recorded.

PHYSIOLOGY.—Circulatory dynamics can be presented through the use of animated diagrams, direct photography using slow motion and stereoscopic photography. In the case of the heart, particularly, a more satisfactory conception can be created of such phases as synchronization of valve mechanisms, abnormal rhythms, changes in excursion amplitude and contractile force.

Other examples in this subject are respiratory movements illustrated through animated diagrams and direct photography, movements of the gastro-intestinal tract through direct photography of the open abdomen in animals and patients and through more complicated technics of roentgenray cinematography.

PHARMACOLOGY.—Typical examples are conclusive patterns produced by various drugs such as strychnine, metrazol, picrotoxin, insulin, cyanides, release phenomena and paralytic effects of depressant drugs; bizarre plastic states produced by drugs such as bulbocapnine; characteristic ataxia and startle pattern produced by cannabis; hyperactive cord reflexes of codeine and morphine; withdrawal behavior after opiate addiction; cocaine excitation, with circus movements; atropine excitation, with photophobia; physostigmine with fibrillary tremors and excitation; cyanosis with methemoglobin producing drugs; cherry-red blood pigment of monoxide poisoning; effect of drugs on anaphylactic phenomena (reference here is to the new series of technics now being used for testing the value of antihistamine drugs); effect of drugs on Langendorff isolated heart

preparation; effect of drugs on heart in open-chest preparation; effect of drugs on movements of stomach and intestine; effect of drugs on movements of gall bladder, urinary bladder and uterus.

In such pharmacological demonstrations, it is possible to delineate drugs more clearly by the use of masking devices and double exposure, so that the effects of the movements of the normal organ are contrasted on the same screen synchronously with the movements of the same organ under the influence of drugs.

Technics suitably demonstrated are: methods of administration of drugs; preparation of fistulae for recording; arrangement for recording blood pressure and respiration; arrangement for recording movements of the isolated heart; arrangement for recording changes in the heart-lung preparation; arrangement for recording movements of isolated tissues such as gut, uterus, arterial strips, papillary muscles. Brief presentations are possible showing main features of clinical conditions satisfactorily treated with drugs and particular demonstration of features altered by drug action.

The "canned lecture," frequently revised, is particularly adapted to this field where fundamentally new drugs are being introduced so rapidly.

BACTERIOLOGY.—Time-lapse photography showing growth patterns of bacterial multiplication amounts to a new dimensional concept of an important and characteristic feature of bacterial growth.

Technics of media preparation, staining, plating, and inoculating lend themselves well to audiovisual demonstration.

Photography with the electron microscope is capable of much wider application than now exists.

PATHOLOGY.—The film strip method of projecting a series of stills has great usefulness in this subject, permitting a convenient and quick correlation of microscopic sections, gross autopsy findings and clinical appearance.

The dynamics of body defenses, inflammation, fibrosis, necrosis, abnormal cell division, is subject to cinematic presentation in further ways than yet attempted.

CLINICAL PATHOLOGY.—Technics of stains, smears, blood counts, sero-diagnostic tests, methods of microscopic examination, can be quickly shown on film strips or motion pictures.

PHYSICAL DIAGNOSIS: *Inspection.*—Three dimensional photography in either stills or moving pictures provides good opportunity for instruction, particularly in that abnormal conditions can be presented conveniently and rapidly.

Percussion and auscultation can be demonstrated in so far as auditory perceptions are concerned. The newer methods of recording by magnetized wire or tape are capable of reproducing heart sounds, rales, etc., with greater fidelity than previous use of phonograph records or sound track on film.

Reflexes, both normal and abnormal, can be presented effectively.

Abnormal gaits and movements.—The full coverage of both common and

rare conditions can be accomplished, as with tabes, Friedreich's ataxia, Parkinsonism, chorea, cerebellar tumors, Wilson's disease, tetanus, tetany, etc. Animated diagrams and slow motion photography reinforce the exposition.

ANESTHESIA: *Signs and stages of anesthesia.*—Most of these are movement phenomena such as respiration and eye signs and are especially suitable to cinematic reproduction. Characteristic features of anesthesia with different agents can be quickly demonstrated.

CLINICAL SPECIALTIES

Well organized and well illustrated lectures covering the clinical syndromes in all of the clinical fields should be available on sound motion picture film and film strips.

SURGERY.—Surgical operative techniques in all branches of surgery have been extensively recorded by cinematic techniques. However, many of these films could be improved by extensive editing. The diagnostic procedures used in general surgery and in its various specialties have been less well recorded. These procedures are of greater importance to the medical student and their recording should be improved and amplified. This is equally true of urology, neurosurgery, plastic surgery, chest surgery, orthopedics, ophthalmology and otolaryngology.

MEDICINE.—Many of the procedures used in routine examination of patients by students beginning their work might be presented more rapidly through audiovisual methods. Much of the basic information pertinent to a given procedure might best be summarized most effectively through audiovisual aids. These certainly would be less wasteful of student time than some of the less well prepared or extemporaneous attempts at correlative teaching. The special problems encountered, the special diagnostic procedures used, the special therapeutic measures and their rationale in all of the specialty fields in internal medicine could be presented most concisely through audiovisual aids. This is equally true of syphilology, dermatology, allergy, immunology, gastroenterology and cardiology.

PEDIATRICS.—Since most medical students have had little first hand experience with children they can profit from very simple audiovisual aids showing even how to hold and bathe a baby. In addition the special diagnostic and therapeutic procedures could be best presented by motion picture or film strip. Normal growth and maturation and an exposition of the more commonly encountered developmental anomalies can best be presented on film strip with an accompanying sound recording.

NEUROPSYCHIATRY.—In neuropsychiatry the recording of a patient's voice is sometimes as important as a motion picture of the patient's behavior. Consequently in this clinical field the patient's voice should be synchronized with a picture of his behavior. This can be accomplished either with sound motion picture or with a separate recording on sound tape. The use of these audiovisual aids has already been proven to increase the rate of student learning. Although

some of the audiovisual aids of this type are excellent, more are needed. There is also a need for more film strips illustrating the steps and the most advantageous sequence in examinations of neuropsychiatric patients. The theory and the practice involved in such special procedures as electrical shock could be presented most advantageously through audiovisual aids. The presentation of the theory of the recording and the interpretations of the electroencephalogram could be expediated through these aids.

OBSTETRICS AND GYNECOLOGY.—The existing motion pictures of delivery and surgical procedures related to obstetrics and gynecology might be improved by stringent editing. The orientation of the student for special features of pelvic examination might be speeded up by the use of films or film strips. These procedures would also be helpful in the teaching of the aspects of endocrinology as related to obstetrics and gynecology and in the changes in the fetus and mother during pregnancy. Some of the special problems of pregnancy, delivery and fertility could be presented advantageously by audiovisual aids.

The establishment of a Medical Film Institute is a desirable goal to work toward. It is important, however, that progress toward this goal occur in such a way as to include the best available creative thinking of persons interested in medical education as a whole. The relationship between the Medical Film Institute and the medical educator should be such as to permit maximum autonomy and creative efforts of each group while insuring teamwork and avoiding duplication of effort.

Your committee feels that local experiments in audiovisual education do not necessarily have to be funnelled through the Medical Film Institute. Projects could be initiated and carried on by individual schools and individual faculty members for their own personal needs as heretofore. In fact, your committee feels that such local experiments should be encouraged. The Medical Film Institute would be available to any medical school desiring to take advantage of the services it has to offer.

After consultation with the Inter-Departmental Committee and with educators in the audiovisual field, your committee felt that the establishment of a Medical Film Institute would require a budget of about $100,000 a year. The Executive Council of the Association of American Medical Colleges authorized the committee to canvass the possibility of raising this fund from foundations or other interested agencies which might contribute to the support of such an enterprise. This fund would enable the Institute to employ a professional staff of technical experts to advise with medical educators. This staff would include specialists in medical film evaluation and cataloging, editorial assistants, a film editor, a shipping clerk and secretarial staff. The fund would also provide for rental of space and necessary travel.

Your committee would welcome comment from any medical school or faculty member regarding this proposed plan. It was not deemed advisable nor was there time to send out a questionnaire to all medical schools for suggestions, criticism or comments. It was felt that these published data would reach

all medical schools promptly and allow time for adequate study of this proposal and would be a more effective means of creating interest in this project.

Your committee welcomes suggestions on methods of procedure for raising funds to establish the Medical Film Institute.

Sufficient funds should be available to insure the establishment of the Medical Film Institute for at least five years. It was felt that this period of time would serve to establish the true value of audiovisual aids in medical education. It is believed that the development of superior medical film patterns will find a ready acceptance and use in the curriculum of medical schools.

An Outline of a Plan for the Joint Development of Medical Films and Associated Visual Aids

A Statement by the Inter-Departmental Committee on Medical Training Aids prepared for the members of the Association of American Medical Colleges

The Chairman of the Audiovisual Committee of the Association of American Medical Colleges was approached recently by the Inter-Departmental Committee on Medical Training Aids with a plan for the joint development of medical films and associated audiovisual aids. The plan proposes to develop film activities in medical education.

The Inter-Departmental Committee is composed of representatives of the War Department, Navy Department, Veterans' Administration and the U. S. Public Health Service. These agencies have begun to produce teaching films in connection with extensive graduate medical and scientific training programs. The committee was organized in July, 1946, at the invitation of Secretary of the Navy Forrestal to coordinate medical film production within government agencies so that duplication would be avoided and maximum coverage could be given to subjects of common interest.

The committee began by cataloging existing government medical films and those in production under the various subject matter divisions of medical education. This composite catalog reveals neglected areas in which new production is strongly indicated. It also shows that existing films do not begin to cover the field, and indicates the size of the production task required.

It was obvious from the outset that a large area of common interest exists, and that all Services might benefit from the efforts of each. It was also apparent that infinitely more could be accomplished by working together on this problem than by each working separately—and at less cost.

The task appears so large it can only be accomplished through integrating the facilities and talent not only of government, but private professional institutions and agencies as well. No such far reaching film plan can be successful without the participation of our medical teaching institutions with their ability

to make creative contributions which require freedom to grow and a scholastic atmosphere to survive.

Briefly, this was the tenor of the meeting of the Inter-Departmental Committee on January 29, 1947, which was attended by Dr. Walter A. Bloedorn, Chairman of the Audiovisual Committee of the Association of American Medical Colleges. At this meeting, he expressed the interest of his Association in a proposed program of joint action for improving medical film production and utilization, both in medical schools and in the extensive graduate medical training programs of the Services. He invited a representative of the Inter-Departmental Committee to outline the program at the meeting of the Executive Council of the Association of American Medical Colleges, held in Chicago, Illinois, February 8, 1947. At this meeting, the Inter-Departmental Committee's representative proposed that the Association of American Medical Colleges secure funds for the establishment of a medical film institute which would conduct such activities as are necessary to study, organize and improve both technical and non-technical films and other audiovisual aids in medicine and the allied sciences. On their part, the four Services will have available facilities, authorized appropriations, and personnel for the production of films jointly agreed upon with the Association of American Medical Colleges, and arrange for medical institutions to obtain prints of these films at approximately print-cost price. After some discussion, the Executive Council voted in essence:

1. To endorse the proposed plan.

2. To empower Dr. Walter A. Bloedorn to take measures relative to raising $100,000 plus per annum for a five-year period for the establishment of a Medical Film Institute which woud develop a working pattern for the production and wider use of audiovisual aids in medical education.

3. To authorize him to approach foundations and other interested agencies which might contribute to the support of such an institute, and, on receipt of such contributions—

4. To empower Dr. Bloedorn to work with the Inter-Departmental Committee with a view toward establishing the Medical Film Institute.

Before outlining how the program of the Medical Film Institute could be successful, it seems advisable to discuss very briefly the state of films in medical education at the present time.

THE PRESENT STATE OF MEDICAL FILMS

Experience has proved that films and other audiovisual media can be stimulating, intensifying, and time-saving training aids of great efficiency. They are used successfully in the field of medical and scientific education for the instruction of Army, Navy and U. S. Public Health Service personnel on all training levels. Films, if expertly constructed, carefully produced, and effectively used could do equally as good a job in peacetime medical education. The medical curriculum is increasing but the time allotted the student to master this load remains unchanged. This fact alone is a weighty argument for using the full potentialities of films in medical education.

Until now many of these potentialities have not been developed. The production of medical films has rested largely with physicians themselves. These men are dependent upon clinical photographers to meet their day by day photographic needs. Few of them, however, have had the opportunity to learn the many complexities of skilled motion picture production. On the other hand, equally few trained film personnel have had the opportunity to learn enough of the complex details of medicine to portray satisfactorily scientific subject matter. For these reasons, although thousands of medical films have been made, most of them are limited to the recording of techniques, cases and experiments. As a consequence, there is a scarcity of good professional training films integrated with medical curricula. Moreover, the use of existing films is hampered by the lack of a comprehensive and analytical medical film catalog and it is often difficult to obtain films where and when needed because most of them are in the hands of their authors who are not equipped to distribute the films extensively. Teachers of medicine are familiar with these problems and many are coming to realize the fact that existing shortcomings are not inherent in the film medium itself.

Despite these shortcomings, there has long been an urgent demand for medical films—particularly in the specialty fields and postgraduate education. Film committees have been set up over the years by a number of medical organizations which realized the value of films. Such committees were organized by the American Medical Association, American College of Surgeons, American Public Health Association, Conferences of Professors of Preventive Medicine, Association of American Bacteriologists, and the Association of American Medical Colleges itself. These committees, despite their valuable work, have been too handicapped by limited facilities to advance effectively the production and use of films. It now seems clear that their aims can only be achieved by the intimate collaboration of medical men and film specialists—the best operational framework for which would be a Medical Film Institute.

A PROPOSED PLAN OF THE MEDICAL FILM INSTITUTE

The Medical Film Institute should be a film agency serving medicine by providing an independent voluntary organization in which medical educators and film specialists could work together.

The primary objective of the Medical Film Institute would be the establishment of a good pattern for the joint production and use of teaching films and other audiovisual aids as an integral part of the medical curriculum.

The proposed plan to improve the pattern of medical film production and utilization would not in any way supplant currently existing programs in either the medical schools or the photographic laboratories of the participating government agencies. Participation in the plan would not be mandatory but purely voluntary, thereby maintaining the autonomy of the individual medical school and the participating government agencies. The plan would aim to serve all without hampering any.

The Medical Film Institute would provide facilities and staff to coordinate

and help develop, on a voluntary basis, the film activities of medical institutions represented by the Association of American Medical Colleges and the participating government agencies, as well as recognized medical and health agencies. Such facilities are urgently needed because all are faced with the same basic problems of organizing and improving medical and scientific films.

It is anticipated that the medical schools would initiate and the participating government Services integrate requests for needed medical films through the Medical Film Institute. It is anticipated that some of the films requested would not lend themselves to joint use by medical schools and the participating government agencies. One of the functions of the Medical Film Institute would be to determine the specific areas in which films would find a common acceptance. Production of films falling within this framework would be requested of one of the four Services. For film requests not in this category, i. e., those of local or specialized interest, the Institute would provide assistance in planning. At all times, the Institute would seek the educational and scientific advice of medical institutions and specialists.

To conduct such activities, the participation of able film specialists is indispensable as is that of the medical educator who insures authenticity and accuracy of the medical film content. Such film specialists exist; the number is so small, however, that their strength has been fragmented among the half-dozen groups competing for their services. This is a cogent reason for developing and organizing a central operational body to pool creative talent in this specialized field.

Beyond the joint plan briefly described above, it is visualized that the Institute would perform certain basic tasks which can be outlined as follows:

PRODUCTION DEVELOPMENT

Generally, the Institute would serve medical schools, participating government agencies, and official and non-official medical and health agencies as a voluntary clearing house for all phases of production. It would help develop the best standards of film technique and disseminate such information. It would study and determine the areas in which films could make a specific contribution; it would analyze individual medical courses in terms of educational objectives and suitability for film treatment.

FILM UTILIZATION

The Institute would, in collaboration with medical educators, assist in the development of methods which would permit teacher and student to make the best use of films and related audiovisual material as functional components of medical instruction. In addition, it would study the standards of projection equipment and facilities, institutional film libraries, and problems of administration. The results of these studies would be made available.

FILM CATALOGING

The Institute would prepare for distribution a catalog of all available medical films, giving for each film a statement of its purpose; an exact content descrip-

tion; an analysis of scientific, educational and cinematic value and suggestions for its use. Such a catalog would greatly simplify the finding, procurement and use of films in teaching.

FILM DISTRIBUTION

Present medical film distribution is largely unorganized and inadequate to meet current demands. Although many medical institutions may establish their own film libraries, it is anticipated that the majority of films used would continue to be secured, as heretofore, on a rental or loan basis. The Institute would undertake to develop an efficient system of film distribution.

MEDICAL FILM TRAINING

Continued advancement in the field of medical films is dependent on creative medical film personnel. As has been stated elsewhere, such personnel are few in number. It would be equally advisable to provide basic film training to medical teachers who might be required to participate in film production. One of the important tasks of the Institute would be to advise and help organize training programs to develop such personnel. Cooperative and experimental production centers might be set up in medical institutions to implement this training.

INTERNATIONAL FUNCTIONS

There has been an increasing demand for American medical films from abroad. The Office of International Information and Cultural Affairs of the Department of State, the World Health Organization, United Nations Educational, Scientific, and Cultural Organization, and other United Nations Specialized Agencies are interested in facilitating the international exchange of medical films. Medicine speaks an international non-political language which, through films, could help augment the free flow of scientific information across national boundaries.

The Medical Film Institute could advance international medical relationships and make important contributions by organizing, between the United States and other nations, an exchange of medical films and film personnel and by participating with foreign medical film agencies in international production and planning.

STAFF OF THE INSTITUTE

The activities of the Medical Film Institute require a staff of specialists that could devote itself fully to devising good patterns for the production of curriculum integrated films, determining areas in which films could make specific contributions, studying content and structure of films, and formulating methods for their effective use.

The success of the Institute depends on the creative abilities and competence of its staff which should consist of especially qualified medical educators and film specialists. It would carry a heavy pioneering load and the results of its labors would have wide and significant application. Such responsibility requires that the staff have freedom of action and flexibility in composition. It is assumed

that the basic staff would be increased by temporary personnel assigned by participating organizations to carry out specific jobs or to obtain training.

OPERATIONAL PLAN

A detailed operational plan is, of course, not possible at this time. Such a plan would be developed jointly and promulgated when the Medical Film Institute is actually established.

INTER-DEPARTMENTAL COMMITTEE ON MEDICAL TRAINING AIDS

Dr. EDWARD M. GUNN, Chairman; Chief of Training Doctrine Branch, Education and Training Division of the Surgeon General's Office, War Department.

CAPTAIN L. R. NEWHOUSER (MC), USN; Head, Training Branch, Professional Division, Bureau of Medicine and Surgery, Navy Department.

MR. BERNARD V. DRYER; Chief, Audiovisual Section, U. S. Public Health Service.

MR. C. GRAHAM EDDY; Chief of Medical Illustration Division, Research and Education Service, Department of Medicine and Surgery, Veterans' Administration.

ACKNOWLEDGMENTS

During the preparation of this report, many authorities concerned with films in medical education were consulted. It is desired to thank specifically the following persons for their valued assistance:

Dr. Justin Andrews, U. S. Public Health Service; Dr. Walter A. Bloedorn, Dean, George Washington University Medical School; Mr. Ralph P. Creer, American Medical Association; Dr. J. A. Curran, Dean, Long Island Medical School; Dr. E. H. Cushing, Veterans' Administration; Mr. Herbert T. Edwards, State Department; Mr. Walter S. Evans, Navy Department; Mr. Orville Goldner, National Association of Secondary School Principals; Mr. Gale Griswald, U. S. Public Health Service; Dr. Samuel Harby, Veterans' Administration; Miss Jean Henderson, U. S. Public Health Service; Professor Thomas Jones, University of Illinois School of Medicine; Mr. W. C. Lown, Navy Department; Dr. J. E. Markee, Duke University; Dr. Adolf Nichtenhauser, Science Service; Dr. David S. Ruhe, U. S. Public Health Service; Captain Robert V. Schultz (MC), U. S. Navy; Dr. Trawick Stubbs, Associate Dean, Emory University, School of Medicine; Dr. R. P. Walton, Medical College of State of South Carolina.

The Basis for Teaching Social and Environmental Factors in Medicine in the Undergraduate Medical Curriculum*

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Current interest in the teaching of the social and environmental factors in medicine in the undergraduate medical curriculum can be traced directly to the basic humanistic approach—that concern for all of the health needs of human beings—which has always characterized the true physician. In the mind of such a practitioner of medicine, care *for* the patient has invariably stood foremost among his tasks. The knowledge and skills of modern scientific medicine have been valuable tools to aid him, first, in understanding man, and then, in preventing disability, restoring his patient to health or, failing that, in mitigating suffering and facilitating adjustment of the sick person to his total environment, social and psychological as well as physical.

Almost fifty years have passed since Sir William Osler, then in Baltimore, called attention to the urgent need for the introduction into the formal medical school curriculum of teaching programs which emphasized the careful study of the patient as a living functioning unit in society coping with a vast variety of complex environmental strains and stresses, both internal and external, as well as with some disease process. At times, these environmental factors might be of greater concern to the patient and might require more immediate attention by the physician than the specific pathological process which caused the patient to seek his help.

Today, in at least eight out of ten medical schools in this country and Canada, planned programs of teaching are in progress, designed to aid the medical student to recognize and deal competently with the social and other environmental problems which must be considered in the proper diagnosis, treatment and prevention of illness. These teaching projects show wide variations in methods of instruction and include lectures and seminar discussions, social and environmental case studies, medical-social ward rounds and case conferences, domiciliary medical care assignments and several others. Frequently, combinations of methods of teaching are incorporated in the programs of individual schools.

By and large, the clinician has rightly assumed a place of leadership in the introduction and continuation of these programs. Most often the internist has shown the greatest initiative in pioneering such projects but as one scans the medical schools throughout the country, the psychiatrist, the pediatrician, the surgeon and the obstetrician has each recognized the need for a qualitative

* Read before the Fifty-seventh Annual Meeting of the Association of American Medical Colleges, held in Edgewater Park, Mississippi, October 28-30, 1946.

modification of his methods of teaching. As departments of preventive medicine have developed within the organization of our medical schools, physicians engaged in this increasingly important phase of medical practice have assumed a large share of responsibility for instruction. In addition, other professional workers concerned with the provision of medical care, in its truest and broadest sense, are being drawn into the actual teaching process. Outstanding among these are the medical social workers and, with increasing frequency, one may note the addition of highly qualified members of this profession to the faculties of our leading medical schools. Within the last few months, the director of the medical social service department in a university hospital has been recognized for her significant contribution to the basic training of future physicians with the academic medical school rank of Clinical Professor of the Social Aspects of Medicine.

It is not my purpose in this presentation to consider in detail the programs of teaching the social and other environmental factors in medicine in individual medical schools, nor to attempt to summarize the two year study of the Joint Committee of this Association and the American Association of Medical Social Workers. Dr. Curran, as Co-Chairman, already has presented at an earlier session of these meetings a resumé of the recent work of that Committee and has called your attention to the early publication of a final report which should serve as a valuable source of reference for teaching and for future studies in this field. Moreover, in a paper which is to follow this presentation, Dr. Beckman will consider some aspects of the clinical instruction of social and environmental factors in medicine in a hospital setting. Rather, it is my plan to attempt to relate such teaching projects, which must still be considered largely experimental, to the rapidly increasing interest, both within the profession and among the laity, in the expanding concept of medicine's social responsibility.

The basis for all medical teaching lies in proper preparation of the future physician to meet adequately all of the health and medical needs of people and society. With all the encouraging progress noted by our Committee, there yet remains an urgent need for many additional interested and properly qualified teachers to inspire our students by precept and example to deal more competently with the social and environmental problems which complicate illness. Moreover, there remains an equally great need for further recognition of the importance of this teaching among those of our faculties who are concerned with curriculum planning. Experience in many schools has clearly demonstrated that quantitative alterations in the already overcrowded schedule are far less essential than is the qualitative reorientation of teaching objectives.

A leading medical historian has said: "The picture society has of its ideal physician—the goal of medical education—is determined primarily by two factors, the social and economic structure of that society and the technical means available to medical science at that time."[1] It is to no one more apparent than to this group of medical educators that, at present, both of these factors, the

1. Sigerist, Henry E.: University at the Crossroads, Henry Schuman, New York, 1946.

social and economic structure of the society in which we live and the technical knowledge and skills of medicine, are undergoing tremendous change. Hence, the goal of medical education with which we are most concerned must be considered in equally rapid transition.

Medicine has evolved immeasurably as both a natural and social science. It owes much to the natural sciences, such as chemistry, physics and biology, for many of the dramatic advances in the diagnosis, treatment and prevention of disease have been based directly on equally momentous achievements in these other disciplines. One need only refer to the curriculum of the first two years of medical school to see how clearly the great technical advances in the physical and biological sciences are reflected in the sphere of activity of the physician. The focus of interest of many of our teachers, and hence of our students, has been drawn more and more to the mastery of isolated technological procedures and the understanding of structure and function, both normal and pathological, of organs and systems. Less and less, in medical school teaching at least, has the individual patient been considered as a biological and social unit struggling as a whole against many noxious influences, including disease, both in his external and internal environment. It has been said that in medical education we have broken the human being into his component parts, even into individual cells, better to understand the workings of this marvelous living organism only to become preoccupied with the fascination of the parts and to lose sight of the man. All too frequently the vital processes of synthesis and of understanding the working of the whole have been left to the graduate physician to accomplish as best he can in a later period of actual medical practice.

On the other side of the ledger, we must not permit the brilliant accomplishments of the natural sciences to overshadow the fact that social conditions under which human beings live may contribute to the causation of disease, as well as to satisfactory treatment or prevention, just as much as physical, chemical or biological factors. To be sure, the social sciences have only recently begun to make available to the physician highly refined techniques of study or scientific principles which can be applied readily to every day problems. Too often has the physician been prone to overlook the vast contributions to health made by widespread public education, community sanitation, improved housing and working conditions, better general nutrition and many other social advances; and even at times, he has tended to minimize the importance of economic security of the family and the group in the purchase of specific health and medical services.

As a simple example of what I have in mind, I think it can be substantiated that little advance was made in the control of tuberculosis until there was sufficient understanding of the social distribution of this disease in different population groups and until adequate measures were taken to cope with the social and environmental factors responsible for its perpetuation. This was true even though the biological aspects of tuberculosis were quite adequately understood shortly after the epoch-making discoveries of Robert Koch more than sixty years ago.

Raymond Allen in his recent provocative monograph on "Medical Education and the Changing Order" calls attention to the fact that: "In the presence of increasingly complex social and industrial patterns of society, the individual must make increasingly difficult adjustments for survival. The problem of healthful living in this environment is still unsolved for many people. The physician is called in when something untoward occurs and when the individual (now a patient) is unable to function as a unit in society. Some failures of function may be relatively simple, such as a fractured bone or a bacterial infection of a workman in a factory, for they usually respond to effective, well established treatment techniques. Other failures of the human organism under the stress of modern living are far more complex and less well understood. The businessman who develops a peptic ulcer, for instance, is not so easy to understand or to cure permanently. The increasing number of patients with various forms of neuroses and social deficiencies of one kind or another suggests that the emotional and mental adaptation of many people to the requirements of the times takes place with difficulty. No patient can be fully understood or effectively treated without appreciation of the environmental stresses affecting him and the reactions induced by them.

"Medicine is more than a set of techniques designed to make people whole again and able to function efficiently in society, and no man is a good physician if he is concerned merely with mastering the techniques and skills by which this is accomplished. The fact remains that almost all of the content of the premedical and medical curricula is concerned with training in the more or less narrow technical and scientific fields leading ultimately to competence in diagnostic and curative medicine. Most of such training is essential to the education of the physician, but ways and means must be found to liberalize premedical and medical education if medicine is to fulfill its inherent promise of contributing to the building of a healthier world."[2]

In the clinical years, both undergraduate and those devoted to intern and resident training, we have centered instruction within the hospital. There can be no question that the concentration of highly specialized skills and technical equipment afforded by the hospital is indispensable to the provision of modern medical care and to the proper training of the medical student and physician. It must be remembered, however, that though the resources of the hospital meet a vital social need of the community, the hospital, as now constituted, provides only a fractional part of the medical and health services required by the individual member of society or the group as a whole.

Hospital services from the point of view of the patient are episodic and are utilized primarily at times of emergency when disease is already established or at least definitely suspected. Because of the necessary preoccupation with pathological states, it is extremely difficult to give sufficient attention in hospital practice and teaching to those social and environmental problems which have affected the patient (and his medical problem) before admission, in between

2. Allen, Raymond B.: Medical Education and the Changing Order, The Commonwealth Fund, New York, 1946.

his visits to the hospital or clinic, and not uncommonly, even during the period he is under the care of the hospital physician. It is this qualitative gap in educational programs which the current trend in teaching the social aspects of medicine, mentioned previously, is aimed in part to fill.

It has been estimated authoritatively that as high as 90 per cent of the health and medical problems of a community do not require the type of services now provided by the hospital. This estimate may be somewhat too high and yet the fact remains that modern medical practice cannot be restricted to the problems seen within such an institution. It would seem logical then, if we are to establish firmly in the minds of our students that the every day practice of a physician demands careful consideration of the social and other environmental problems confronting his patients, that we must further avail ourselves of every opportunity for teaching beyond the artificial barriers which now exist around our hospitals. Perhaps in the future, the structure and organization of our teaching hospitals will be so modified as to form a focal point of supply for a greater number of the health and medical services required by the communities in which they are located. There are definite indications of an accelerated trend in that direction but until such a hope becomes a reality, medical educators must turn elsewhere to obtain some of the teaching material required for the adequate preparation of the future physician.

I believe it very unwise and equally unnecessary to attempt to weigh the natural sciences against the social sciences on a scale of relative importance in solving the problems which now confront medicine. It is crucial, however, that we and our students appreciate that each is indispensable and that modern medicine cannot accomplish its tasks in the complex social pattern of the day without resorting to both.

It is clearly the responsibility of the physician, then, to recognize the contribution which the social sciences have to make not only to medicine but to the whole area of human endeavor which bears on the health and welfare of every individual member of society. There is an equally great responsibility for the physician to assume his proper place of leadership in diagnosing, treating and even preventing social pathology, particularly when such disorder clearly affects the health and welfare of those individual members of the group who turn directly to him for help and guidance.

Just one year ago, Vaughn, in discussing "The Graduate Record Examination As an Aid in the Selection of Medical Students" at the annual meeting of this Association called attention to the fact that a representative group of premedical students was "well above the senior average in all scientific subjects (*mathematics, physics, chemistry and biological sciences*) and somewhat below in the so called socio-humanistic subjects. . . . It is interesting to note, however, that this superiority in science of premedical students to the first year graduate average is far less than is their inferiority to this average in social studies, literature and fine arts."[3]

3. Vaughn, K. W.: The Graduate Record Examination as an Aid in the Selection of Medical Students, *J. A. A. M. Colls.*, 21:129-146 (May), 1946.

From some of the discussion provoked by that paper, it seems not unlikely that premedical requirements of at least some of our schools may be subject to change. Until that time, however, the responsibility devolves on us engaged in medical school education to rectify this omission at least during a transition period.

Along with the tremendous expansion of medical knowledge and techniques, medical care has become a highly complicated and expensive process. The funds of knowledge have become so great that specialization of greater and greater degree has been inevitable and no single physician can hope to master all available knowledge. I believe there are now recognized some twenty-five different specialties within medicine alone. More than that, the medical profession, which a few generations ago was the sole source of medical care, now wisely calls on a long list of highly trained co-workers and technical assistants. The best available figures indicate that there are approximately one and one-half million persons engaged in the health and medical field and thus the doctor represents only one in ten of those participating in this type of service.

Relatively, a few years ago, the hospital, too, stood alone as a community resource available to the physician to supplement his efforts in his office or in the home. Today, though the addition of new hospital beds and clinic facilities has kept abreast of increases in the population, hospitals represent only one of many community centers taking part in health and medical services. Countless numbers of public and voluntary health agencies have taken their place beside the medical profession and offer their services to the physician and, in turn, request the guidance and direction which he alone can give.

I have dwelled somewhat at length on the vastness and complexity of modern medical service because I wish to emphasize that despite its mammoth proportions, medical care must always remain a highly personal service; one based on the intimate personal relationship of physician and patient. Even though a huge number of persons are now engaged in medical care, the physician occupies the hub position around which all others must rotate. It is his task to correlate, direct and supervise the work of all others and it is to him the patient invariably turns for help and guidance in utilizing other skills. In this relationship alone, the physician has a staggering social responsibility for which he must be prepared in his training period.

There can be no doubt that many of the greatest challenges to the physician today lie in the prevention of disease and human suffering. To aid in equipping the medical graduate to meet these challenges more effectively, departments of preventive medicine have been introduced into the medical school teaching structure. Perhaps, the addition of a separate department of that name has been responsible for the development of the unwarranted assumption that preventive measures form a special discipline and need not concern the average practitioner. One has only to turn to the practice of modern pediatrics or obstetrics, though almost any other branch of medicine would serve the purpose, to dispel this misconception.

To be sure, preventive medicine has made its greatest imprint on the health

and well being of society in those areas in which measures have been directed either to the group as a whole or to special groups exposed particularly to one or more hazards. Such measures have been effective because they have dealt not only with the immediate but also with the more remote causes of illness. Not infrequently these are to be found in the external environment, physical, social and even psychological. As we succeed in coping with the hazards to health which are vulnerable to group or communal attack, the physician is being called on to concern himself more and more with those problems which can be solved only by dealing with the social, psychological and physical environment of the individual.

Ninety per cent of our graduates will enter the private practice of medicine. As practitioners they will be engaged in the close personal association which has been described as the doctor-patient relationship, that synapse through which the major share of the knowledge and skills of the physician must flow in providing medical care. Medical education of the past has shown us how we may prepare the student with the tools of the physical and biological sciences needed for proper practice. Medical education of the present has begun to take greater cognizance of the need for equipping our students with the knowledge and skills required to care for the patient, not only as an aggregate of organs and physicochemical processes but as a living functioning unit of a complex society.

It is significant that in the last few years, marked by the greatest social turmoil that man has yet experienced, at least three medical schools in Great Britain and an equal number in Canada have introduced into their faculties new departments charged with the responsibility to teach and to advance knowledge in the vital sphere of medicine's social responsibility. I do not believe it germane to this discussion to consider the relative merits of adding a separate department against those of conjoined teaching within already existing medical school structures. It is far more important that all members of our faculties now recognize that the practice of medicine in the future requires a further extension of our present preclinical and clinical teaching into the area which Professor Ryle of Oxford University has chosen to define as social medicine. This "embodies the idea of medicine applied to the service of man as *socius,* as fellow or comrade, with a view to a better understanding and more durable assistance of all his main and contributory troubles which are inimical to active health and not merely to removing or alleviating a present pathology. It embodies also the idea of medicine applied in the service of *societas,* or the community of men, with a view to the lowering the incidence of all preventable disease and raising the general level of human fitness."[4]

4. Ryle, John A.: Social Medicine: Its Meaning and Its Scope, *Brit. M. J.* 2:633-636 (Nov. 20), 1943.

Some Aspects of the Clinical Teaching of the Social and Environmental Factors in Medicine*

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As a teacher of internal medicine who has to speak on the teaching of social and environmental factors, my viewpoint may seem a special one to this audience of deans who must be aware of all aspects of medical education. But my aim is that of all medical teachers—to equip doctors with all they need for the practice of medicine. An indispensable part of this equipment is ability to deal with social and environmental factors. All clinical teachers—wittingly or unwittingly—teach these factors; because they are inextricably woven together with the physical and emotional factors in illness. And it is impossible to discuss any one of these without bringing in much that is pertinent to the others.

You will all recall the character in Moliere's play who, after being told for the first time the difference between poetry and prose, exclaimed delightedly, "Why, then, I have been speaking prose all my life without knowing it!" Similarly some clinical teachers are teaching social and environmental factors all the time—without giving them a name. Having no name has advantages. It keeps the student from being frightened off by the high sounding terms—social and environmental factors—when all he is being taught is the effect of having to live with one's mother-in-law. But the advantage of giving the social aspect of medicine a name is equally great. It helps make the student aware of what is so obvious that he might otherwise overlook it. And, of course, it helps the teacher to relate this part of medicine to the other components.

Clinical teachers are no different from any other kind of teacher. To teach they must first thoroughly know their subject. Next, they must break down the subject into its parts to make sure that each part gets its proper share of attention. The purpose of this paper is not an analysis of everything that goes into clinical teaching but only of what seems to me to be important in the clinical teaching of social and environmental factors. This is not easy to do, because there is so much overlapping with all the other factors in medicine.

Before I go on, however, I should like to make a digression. Professor Simon, writing about classroom teaching,[1] says that the elements of teaching are: the teacher's personality, the personality of his pupils, and the subject matter or skills to be taught. It is the interaction of these elements which is the lesson. In clinical teaching, of course, there is present another element—the patient. A clinical teacher takes all these elements into account as he supervises his students' care of the patient. Of course he uses many other methods of instruction: teaching by example, by demonstration, by didactic discourse. But supervision of practice is the most important. The task of the clinical teacher is

* Read before the Fifty-seventh Annual Meeting of the Association of American Medical Colleges, held in Edgewater Park, Mississippi, October 28-30, 1946.

1. SIMON, HENRY WILLIAM: Preface to Teaching. Oxford University Press, 1938. 2nd printing.

to enable his students to practice medicine with intelligence, initiative and judgment. He does this by giving them as much responsibility as they can shoulder in the actual management of patients' illnesses and by helping them develop the skills they will need in applying what they have learned in classroom and laboratory. In addition to all this, he encourages the development of character and trains attitudes.

The training of attitudes is fundamental in the teaching of social and environmental factors. The attitudes of the student determine how successful he will be in obtaining his patients' confidence. This training of attitudes is accomplished partly by example, for students tend to imitate their teachers. It is also achieved by careful supervision of the student's work with patients, by at once pointing out what attitudes are wrong and by urging the student to adopt new ones. Sometimes the teacher can make the student see how a wrong attitude arose from a sense of frustration or some other personal limitation. In any case, teachers must always be on the alert for opportunities to help the student develop his professional self. His responsibility to his patient and society requires continual emphasis, and he should get as much help as he needs in discharging this responsibility properly.

The skills that are basic in dealing with social and environmental factors are not peculiar to this field of medicine. They are basic in dealing with all the factors in medicine. Five of these skills, however, have particular relevance here. First is skill in making full use of the relationship between the student and his patient. The others are: skill in interviewing, skill in teamwork, skill in the use of consultants and skill in recording.

The first skill is, perhaps, the most important. The patient has come for help. His need, in combination with his belief that the doctor can give him help, generates a very great force that becomes an important instrument in the management of his illness. Students must be taught how to develop this force and how to use it. Depending on such qualities as what manner of man the physician is, his attitudes toward the patient and his illness, his sense of responsibility and his professional knowledge and skills, its usefulness can be greatly increased or completely destroyed. The teacher must help the student develop all of these qualities. To concentrate on any one of these at the expense of the others would keep the student from achieving the full armamentarium of a physician.

Dr. Raymond B. Allen has pointed out that medical education begins at birth and ends with death but reaches maximum intensity during medical school years. All of the student's background shapes his capacity for becoming a physician. His teachers must help him to know himself. This is a responsibility of all medical teachers. The student must understand where his prejudices are valuable and where they are harmful in his practice of medicine. He must learn to recognize his patients as individuals beset by serious difficulties and to avoid making any critical judgment of their actions. He must learn to make an honest effort to understand and help.

The patient can not get help, nor can the doctor give it, without an interview. The interview is absolutely essential to the practice of medicine. I some-

times tell my students that I would rather look after a horse than a patient who does not speak English. At least, the horse's owner would give you some idea of what might be the matter. But even when patients speak your own language it requires skill to make an interview valuable.

Whenever one man asks another for help or advice, he first tells him his problems. The advice given will, of course, depend to some degree on his advisor's estimate of him. The degree to which the advice is followed will likewise be governed by the opinion he has of his advisor's knowledge, experience and character.

A professional interview so much resembles this ordinary social give and take that it is difficult to state the difference. The men who first devised history taking outlines recognized the importance of form and structure in a medical interview. Symptoms which might seem unrelated were grouped together to help students perceive syndromes. But history taking is only a part of skilled interviewing. They bear the same relation to each other that throwing does to pitching. If one is to learn to pitch, one must first be able to throw. In both cases much training and practice are needed to develop the more refined skill.

The purpose of a professional interview is not merely to gather facts but also to determine how the facts are interrelated. Each case is a jigsaw puzzle; we must not only have all the pieces but we must be able to fit them together. All parts of the patient's problem—physical, social and emotional—must be known and, before any solution can even be hoped for, related to each other.

Interviewing requires a knowledge of human nature and knowledge of self. The interviewer must be able to understand the motives behind the patient's actions. He must be aware of the part he plays in guiding the interview. Although questioning is important, it is not as important as listening and should be kept at a minimum. The patient must be allowed to tell his story in his own way, the interviewer keeping himself on the alert for such things as obvious gaps in information, topics that seem painful, inappropriate laughter, weeping, flushing, and so on. They will help him in his subsequent questioning. He will, in his own mind, be continually arriving at hypotheses of the true nature of the patient's problem. That things are not always what they seem to be is always being proved true in medicine. Patients are often unconscious of what really bothers them. As each hypothesis is made, it will be subjected to the successive tests of new facts as they are learned and, if necessary, it will be discarded and replaced by a new one. Finally, a fair approximation of the situation is reached. Sometimes this assessment can be accomplished only after a series of interviews. Ultimately the interviewer must make some interpretation to the patient, such as purely medical advice or helping the patient see a relationship between two previously unassociated lines of thought.

Skill in interviewing is developed chiefly by practice, but the teacher can do a great deal to help the student. Much of the knowledge we have in this regard we owe to psychiatry where the interview is an important tool, not only in diagnosis but in therapy also. This knowledge is very helpful to other clinical teachers and ought to be used in their teaching. Students come to the clinic

prepared in some measure for interviewing by their earlier experience in history taking. For this reason, it may not be necessary to have them write out verbatim accounts of interviews; but most students find such experiences valuable. It is necessary for the students to talk over their interviews in detail with their teachers, who will point out obvious leads that were missed as well as those that were followed. Some students frankly admit that they were embarrassed, or afraid of producing tears, and, therefore, skirted around important points. Such men are apt pupils, having come more than half way on the road to becoming a good interviewer by recognizing the importance of their own part in the interview.

From our viewpoint the interviews will be used to find out the role social and environmental factors play in respect to the other aspects of the patient's problem. It is also how we discover his emotional responses to the things around him. But our specific realm cannot, except for purposes of analysis, be divorced from the rest of his problem.

The interview usually takes place as a private, personal affair between doctor and patient. It is rare, however, to find a situation where the doctor can handle the patient's care by himself. He usually enlists the aid of others—the patient's wife or landlady or some highly specialized scientist. In all such cases, the doctor and his helpers make a team, and skill in teamwork is one of the important things to develop in students. They must learn to work smoothly with others and to blend their own contribution with the goal of the team. Most important of all, they must be made aware of how absolutely necessary it is for members of the team to tell the patient the same thing. Nothing is more shattering to the patient's sense of security than hearing divergent points of view from the different members of the team. To achieve this necessary uniformity, the members of the team must confer with each other frequently.

Such a conference, attended by social workers, nurses and medical staff, has proven a valuable means for the clinical teaching of social and environmental factors in medicine. The medical students are responsible for both medical and social information in their own cases and they are given a chance to report their findings. They are given instruction in how to deal with the various aspects of the patient's problems, interrelationships are pointed out, and the doctor's responsibility is always emphasized.

Akin to teamwork, and necessary for its smooth operation, is the proper use of specialists, in other words, the bringing into the team of persons who can make a unique contribution to the patient's well being. This group includes other doctors, nurses, dietitians, physical therapists and, particularly, from the point of view of this paper, social workers. No one can be expert in all the skills of medicine, ranging as they do from such abstract fields of knowledge as the theories of nuclear physics to such practical ones as bed-making. And no one need be. The doctor must first know what sort of help he can get from the many specialists. Next, he must refrain from hampering them by suggesting procedures and techniques. He will say to the psychiatrist, "This man has emotional conflicts that seem to come out of his war experience. Will you help him solve

them?" He should not say, "Will you please hypnotize him? Will you please interview him under the influence of a barbiturate? Will you please psychoanalyze him?" The problem should be stated and the means of its solution left to the discretion of the specialist. Furthermore, the doctor must prepare his patient for the specialist's arrival on the scene by pointing out to him that his is a special kind of problem which needs expert handling; that the expert—surgeon, social worker, psychiatrist, or whatever—will help him with his difficulty and that the specific measures to be undertaken will be decided by the pooling of all the knowledge bearing on his case.

The last skill mentioned—skill in recording—is so obvious that you may wonder why I even bother to mention it. Recording is writing down what one has observed. In clinical practice one has to decide what is important and to indicate what one believes to be the relationship between the facts recorded. It is this subjective element which makes medical recording a skill. Students must be taught to see what is pertinent to the patient's problem and to record it clearly. They must realize that medical records are sometimes subject to public scrutiny and that no irrelevancy which might embarrass the patient should be included. In other words, skill in recording depends on skill in evaluating the information obtained.

I said at the beginning that I was going to talk about the clinical teaching of social and environmental factors and so far I have touched only on matters which are part of clinical teaching in general. I did this because I believe that without teaching them the clinician cannot teach social and environmental factors. They are necessary for making full use of the science of medicine. What good is all our knowledge of thyroid physiology if, as recently happened at the Massachusetts General Hospital, a patient with myxedema refuses to take thyroid because of a violent prejudice against pills of any kind? All our scientific knowledge cannot help him if we lack the skill to discover and remove the cause of his prejudices. But neither would any amount of skill help without the scientific knowledge. Both are essential.

So also is knowledge of social and environmental factors essential. We know something and are learning more about this aspect of medicine. And the part these factors play in illness in many cases is so obvious that they are apt to be taken for granted by doctors and teachers alike.

Everyone has to adjust to his physical and social environment. Even the simple act of crossing a street confronts us with the physical fact of an approaching car or what we might call the social fact of a red light. Our actions are governed by how we react to these facts. The usual response is to wait for the car to pass and the light to change. But a man who wanted to die would step in front of the oncoming car or truck or bus. And a man who felt impelled to resist discipline wherever he found it would cross against the light. Our own opinion of his action would be based on what we knew of him and the fact that we are aware of what is usual behavior. Knowledge of standards of human conduct is essential to dealing with social and environmental factors as they affect patients.

The student comes to the clinic with much of this knowledge gained from

his past life. He has lived in a family and in society and by virtue of this experience alone he understands a great deal about family relationships, social taboos, work, money and much else that is common experience. Only a shift in the teacher's emphasis, therefore, is necessary to make the student grasp their significance to his patients.

Their significance will vary from case to case. Factors that govern the individual case are the nature of the illness and the patient's cultural background. A knowledge of mores and customs is essential to the doctor's understanding of his patients. He must know to what extent their behavior and their health are governed by their religious beliefs, their political convictions, their social status and customs. Doctors and students both must know what to expect of patients, families and society. This knowledge can best be imparted to medical students by formal exercises based on the social sciences and the humanities.

Another thing that could well be taught by formal lectures are certain aspects of the role of social and environmental factors in disease. Here, I would include instruction in industrial disease, public health and sanitation, and nutrition. Also important is the influence of social and environmental factors in illness. The effect of environment in the cause of illness is not obscure when one thinks of the typhoid bacillus in the water supply or of the presence of silica particles in the air of a factory. Poor sanitation, poor nutrition and poor housing all breed disease. Many believe that poor emotional adjustment has the same result. All interfere with the proper management of disease. Students should learn the significance of these factors.

It is of first importance, also, to teach students about the many resources that are available for helping the sick, and how to use them. In most teaching institutions, medical social service links the hospital with other agencies such as public welfare, social security and others. Under such circumstances, all the physician needs to know is how to use medical social service, in the same way he uses other specialists.

Unfortunately, medical social service is not universally available and many graduates will have to practice without its help. They will have to be taught about the resources at the physician's service and medical social service can help a great deal in providing this knowledge. Even if these resources are not available in the community where they will be practicing, the students should know that they exist elsewhere. For the physician is a member of society and it is his responsibility to use his influence to develop what society needs.

In this analysis of the things that I feel should be included in the clinical teaching of social and environmental factors in medicine, I have drawn heavily on the experience of the Joint Committee of this Association and the American Association of Medical Social Workers for the study of the teaching of social and environmental factors in medicine. But the opinions are mine and I must accept full responsibility for them. It seems to me that it is not elaborate alterations of the curriculum that this teaching needs but, rather, more conscious emphasis on the part of clinical teachers. As Justice Oliver Wendell Holmes once wrote, "Emphasis on the obvious is often more important than the elucidation of the obscure."

State Funds in Support of Medical Education

HERMAN B WELLS
President, Indiana University
Bloomington, Indiana

For some years I have been serving as a member of a committee of the American Council on Education on Relationships of Higher Education to the Federal Government. This committee has cooperated with the Association of American Medical Colleges and with the associations of other professional schools in solving troublesome war and postwar problems. We spent a considerable amount of time discussing the terms of ASTP medical school contracts with representatives of the armed forces. It was in this work that I first learned to my amazement that there were no reliable comparative data for medical school expenditures. With even greater amazement I heard it stated time after time that it was impossible to compile such data. The armed forces, although ready to give battle to the Japs and Germans, retreated in disorder rather than dispute those who took this position.

Dr. Zapffe, who has long managed your affairs admirably, is without fear; and inspired by this courage I, in a reckless moment, accepted his invitation to participate in this symposium.

I cannot agree that it is impossible to compile accurate figures concerning medical school expenditures. It is possible to reduce to comparable terms income, expenditures, and various types of costs for any group of educational institutions, business concerns, or units of government. The quality of the product or of the services rendered as a result of these financial operations may not be measurable with exactitude, but the financial extent of these operations can be compared with precision and accuracy.

The basic sciences are on the march. Important discoveries having a profound bearing on the practice of medicine are being made with startling rapidity. The increasing urbanization of our country brings new health problems. Medical schools must have additional financial support if their training is to keep pace with the changing order. State legislators, however, are not always ready to recognize this need. No doubt there are a number of contributing factors; but in my judgment one of the important factors is a lack of any comparative financial data.

A member of a state finance committee is not much impressed by vague generalizations. He is even less impressed when told that it is impossible to determine how much it costs to operate a medical school. Especially if he is a manufacturer, or banker, or merchant such a statement will arouse his suspicions. He knows that in the business world such statements are sometimes made in order to conceal the facts. The cost of medical education, though

it be in a public or private institution, is public business, and in the long run medical education will gain support by a frank and accurate statement of its costs and of its needs. From my correspondence with Dr. Zapffe I have the impression that he holds this view.

As physicians you know better than anyone else that no conclusions should be drawn until the facts are known. My assignment therefore seemed to require that I attempt to secure data from all of the State University Schools of Medicine. In order to get these data I resorted to the time-honored questionnaire method. Many people had a part in the formulation of the questionnaire. The principal credit goes to the Chief Accountant of my own institution, Mr. John W. Hicks. He was assisted by the Chief Accountant of our Medical Center, Mr. Arthur M. Lautzenheiser; by the Administrator of the School of Medicine and Hospitals, Mr. J. B. H. Martin; by the Administrator of the Methodist Hospital at Indianapolis, Mr. Robert E. Neff; and by Professor Stanley Pressler, of the Indiana University School of Business, and Mr. J. A. Franklin, Treasurer of the University. After the preliminary work was done by these men, a tentative draft was carried to a number of other institutions and to Dr. Victor Johnson and Dr. Zapffe. It was substantially modified in this process, and I wish to pay tribute to all of the men who assisted generously in its formulation. In addition to those I have already named, I wish to mention: Mr. Daniel Colcock, Hospital Accountant, University of Virginia; Mr. Ernest Lentz, Hospital Accountant, University of Michigan; Mr. R. R. Garlough, Chief Accountant, University of Michigan; Mr. Brooks, Assistant Business Manager, Northwestern University; Mr. H. A. Hazelton, Business Manager, University of Illinois Medical Center; Mr. F. A. Ambrose, Business Manager, Mr. E. T. Jolliffe, Controller, and Mr. John Uthoff, Chief Accountant, all of the State University of Iowa; Mr. E. C. Jackson, Chief Accountant, and Mr. Cliff Plank, Assistant Chief Accountant, of the University of Minnesota; and Mr. Neil Cafferty, Controller, of the University of Wisconsin.

In addition we sent a preliminary letter to the presidents of the state universities with schools of medicine, inviting them to suggest financial problems which they wished to have explored. We incorporated as many of those suggestions as seemed practicable.

Originally I had in mind a short and simple questionnaire, but it was expanded to its present somewhat formidable length because of the requests and suggestions of many persons. Such merit as is to be found in the form used must be attributed to my collaborators. I will accept responsibility for its deficiencies. I believe that the answers to most of these questions will be helpful to the medical administrator; but, as far as my discussion is concerned, I am principally concerned with the information revealed in the first schedule which is compiled from the answers to only a few of the questions.

Questionnaires were sent to thirty institutions. Twenty-eight replied. One of these twenty-eight stated that owing to the change in its business staff and

attendant confusion it would be unable to furnish the data. Therefore, we have data for twenty-seven institutions.

In order to assemble comparative data it is necessary to define accurately the nature of the comparison. The general academic administrator or the state finance officer is not concerned with the niceties of cost distribution. They are not especially concerned with the percentage distribution of pathology between the hospital and the teaching budgets. They must find enough money to support the entire operation. Dr. Zapffe's title, "State Funds in Support of Medical Education," is therefore a happy choice so far as I am concerned, for it suggests a consideration of the subject from the viewpoint of the general university budget.

From this viewpoint, therefore, what is a satisfactory formula? Its nature is indicated by the data contained in Schedule 1. From total expenditures is subtracted total income from all patients treated in the teaching hospitals operated by the institutions, and the result is the amount which must come from general university funds and therefore from state appropriation. I recognize that you may not agree with the propriety of this formula, but I am willing to try to defend it during the discussion period. Let us consider Schedule 1. The numbers at the extreme left are for school identification. First, Column 1 gives the total expenditures of the school; Column 2 gives the total income from private patients, sales of services or commodities, and from charges to government or any other agency for indigent care. The amounts in Column 2 subtracted from the amounts in Column 1 result in Column 3, which is the amount spent by the state in support of medical education.

A by-product of our system of training physicians is the training of nurses and various types of laboratory technicians. As an additional by-product the state is able to give a relatively few indigents better care for less cost than would be possible without operating a medical school. These benefits are incidental and are not the result of a conscious objective on the part of public officials. They occur only because they contribute to the total medical school program.

Each individual school can make comparisons for itself, but it can be seen that fees paid by medical students in state schools average about fifteen per cent of the total amount spent. I am inclined to hazard a guess that this percentage relationship in medicine is not far different from that in other colleges of the typical state university.

You will note that Schedule 1 also contains the budget estimates for the academic year 1946-47. A comparison may thus be made between the past year and the present year. This comparison indicates a sharp upward trend in expenditures. This is in part due to increased costs of operation because of inflation. But I have no doubt that it is due also to the laudable ambition of medical faculties to do a better job in light of the new opportunities in medical science.

From the financial data submitted and from the many letters received from presidents and deans offering comments, I wish to offer certain conclusions.

SCHEDULE 1.—STATE FUNDS IN SUPPORT OF MEDICAL EDUCATION.

Code	1945-1946 Total* Expenditures	1945-1946 Total* Income	1945-1946 State Funds Used	1945-1946 No. of Medical Students	1945-1946 Amount per Student	1946-1947 Total* Expenditures	1946-1947 Total* Income	1946-1947 State Funds Used	1946-1947 No. of Medical Students	1946-1947 Amount per Student
1	$ 200,000.00	.....	$ 200,000.00	151	$1,325.00	$ 275,000.00	.....	$ 275,000.00	155	$1,775.00
2	1,626,574.00	$ 884,155.00	742,419.00	357	2,079.00	1,550,044.00	$1,025,372.00	524,672.00	334	1,571.00
3	2,345,730.00	1,627,879.00	717,851.00	325	2,208.00					
4	1,621,033.00	1,014,019.00	607,014.00	257	2,362.00	1,702,297.00	1,025,000.00	677,297.00	260	2,605.00
5	320,191.00	.....	320,191.00	293	1,093.00	430,356.00	.....	430,356.00	288	1,494.00
6 (2yr.)	52,000.00	.....	52,000.00	58	897.00	100,000.00	.....	100,000.00	86	1,163.00
7 (2yr.)	169,800.00	9,544.00	160,256.00	94	1,705.00	180,785.00	9,830.00	170,955.00	80	2,136.00
8	386,052.00	.....	386,052.00	205	1,882.00	417,050.00	.....	417,050.00	210	1,986.00
9	2,019,921.00	1,622,861.00	397,060.00	125	3,177.00	2,087,950.00	1,806,000.00	281,950.00	132	2,136.00
10	1,679,032.00	756,761.00	922,271.00	306	3,014.00	1,826,200.00	747,000.00	1,079,200.00	321	3,362.00
11	2,120,108.00	1,380,835.00	739,273.00	335	2,206.00	2,632,861.00	1,629,000.00	1,003,861.00	335	2,997.00
12	Adequate information not received.									
13	3,922,822.00	2,999,280.00	923,542.00	419	2,204.00	5,071,847.00	4,068,181.00	1,003,666.00	499	2,011.00
14 (2yr.)	291,500.00	83,514.00	207,986.00	64	3,248.00	416,500.00	60,272.00	356,228.00	77	4,626.00
15	1,306,883.00	859,428.00	447,455.00	292	1,532.00	1,633,718.00	879,000.00	754,718.00	289	2,611.00
16 (2yr.)	150,000.00	.....	150,000.00	60	2,500.00	150,000.00	.....	150,000.00	60	2,500.00
17	2,303,844.00	1,559,566.00	744,278.00	280	2,658.00	2,659,275.00	1,800,000.00	859,275.00	280	3,069.00
18	2,318,627.00	1,324,222.00	994,405.00	400	2,486.00	2,366,071.00	1,284,673.00	1,081,398.00	400	2,704.00
19	.....	.....	449,851.00	298	1,510.00	.....	.....	536,182.00	286	1,875.00
20	943,661.00	518,094.00	425,567.00	54	7,881.00	.....	.....	.....	60	.....
21	350,000.00	75,875.00	274,125.00	310	884.00	486,880.00	51,000.00	435,880.00	315	1,383.00
22	1,272,937.00	178,192.00	1,094,745.00	281	3,895.00	1,540,514.00	146,195.00	1,394,319.00	280	4,979.00
23	2,365,000.00	1,275,000.00	1,090,000.00	400	2,725.00	2,051,000.00	1,375,000.00	676,000.00	400	1,690.00
24	249,295.00	.....	249,295.00	165	1,511.00	296,758.00	.....	296,758.00	170	1,745.00
25	1,330,036.00	372,564.00	957,472.00	230	4,162.00	1,961,804.00	536,452.00	1,425,352.00	236	6,039.00
26	1,497,206.00	828,041.00	669,165.00	282	2,373.00	1,706,382.00	927,368.00	779,014.00	282	2,762.00
27	2,173,317.00	1,305,036.00	868,281.00	288	3,015.00	2,180,550.00	1,104,007.00	1,076,543.00	288	3,738.00

* Exclusive of Funds Contributed for Research.
Note: Other schedules and tabular material used at the Edgewater Park meeting may be obtained by writing President Wells.

1. It is possible to secure comparable financial data for medical schools. I, of course, make no claim to perfection for the present compilation, but no difficulties appeared which could not be overcome easily if the compilation were repeated year after year as is the custom in many areas of higher education.

2. Such data yield valuable information for the general university administrator, and, I hope, for the medical administrator. Annual compilation would undoubtedly establish significant trends.

3. There are no financial skeletons in the medical school closets. Medical schools have nothing to hide concerning the cost of educating medical students. At most, without any regard to the by-products, the amount spent by the typical state in training a physician is a trifle compared with the value which the people of the state receive as a result of this training.

4. The amount spent, instead of being fantastically high, is, by any standard of comparison, modest considering the nature, the thoroughness, and the length of the training. The amount spent would still be modest if it were doubled or tripled.

5. Substantially larger expenditures will be required in the future than have been made in the past if the members of society are to have physicians trained to the limit of the potentialities of modern medical science.

It has been a privilege and an honor to appear on your program. I have high regard for this Association and for the work it does on behalf of the great profession which its members serve. May your Association ever prosper to the end that medical education may continue its steady progress.

The Place of Preventive Medicine in the Curriculum*

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The placement of preventive medicine in the curriculum of the undergraduate course in medicine might well be dismissed with the dictum of Sir Arthur Newsholme that "it should pervade the entire curriculum."

Unfortunately, the teaching of the principles of the maintenance of health must still be approached with the missionary spirit, for general interest in it continues to lag. It is motivated by the necessity to spread a habit of thought on positive health that sounds anemic and impractical to those whose thinking and acting is centered on the importunate needs of remedial effort.

That part of the prevention of disease which involves special techniques and methods applicable to the herd and the environment, is more readily admitted as being practical and effective, and, therefore, more easily accepted by others as a matured and well established division of medical service. The first of these two aspects might well pervade the entire curriculum; the second must as surely be allotted time and place among the other departments of study and practice. The problem, therefore, is to find the means to elevate the former to the prestige of a major aim in teaching, and to hold the latter to a legitimate proportion of the time and effort that should be permitted it on the undergraduate level.

Evidences of the past few years reveal a gradual crystallization of our thoughts on the aims and obligations of preventive medicine and the various procedures by which students can be brought to our way of thinking. The numerous solutions of the past have gradually narrowed down to a few more or less well tried techniques of teaching. In this conference, every aspect of our methodology has been reviewed and will be discussed critically. This paper is an attempt to anticipate the outcome of this study in order that we may now consider the very practical point of where it belongs in the daily schedule of medical students throughout their four or more years of study.

The practical aspects are not limited to the time and opportunity of students but involve also the problems of administration, personnel and funds by which they might be implemented. If funds are available or within reach, and the necessary personnel can be obtained, the choice of method is wide open; if either of these is limited, a compromise must be made with the realities and some restricted program adopted.

To take the ideal situation first and assume that there are no material reasons for curtailing the best program possible at this time, what would we do? What would you do if you had complete support and authority enough to institute the best teaching and experience in preventive medicine to your under-

* Read before the Fifty-seventh Annual Meeting of the Association of American Medical Colleges, held in Edgewater Park, Mississippi, October 28-30, 1946.

graduates? As the author of this paper, I will assume the role of pedagogic dictator and tell you what to do!

First, find a man on your faculty or obtain one who will wholeheartedly devote himself to the interests of preventive medicine. I do not particularly care at this moment whether he holds a degree in public health or not; his main qualification must be his unending devotion to the maintenance of positive health and the prevention of disease. I would call him my professor of preventive medicine and give him an office in which to plan and work. I would expect him to be a man of such stature in medicine that he would command the full respect of my faculty. I would then announce that we had a department of preventive medicine.

He would be put to work immediately on two things; first, he would meet with the members of all classes and through stimulating presentation of his subject, inspire them to think (probably for the first time in their medical lives) on the possibilities in preventive medicine; second, he would attend lectures, ward rounds and clinics with his confreres in as many departments as he could cover. He would thereby gain an insight into the thinking and methods of his fellow teachers and be better prepared to approach them on special obligations he will later place on them.

Of one thing I would be certain: that he would not immediately permit his department to be built up top heavy with any single approach to his subject; he could not, at first, inaugurate any intensive course in public health, sanitation, public health administration, epidemiology, biostatistics or industrial hygiene. These are all means to an end for undergraduates and not ends in themselves. They must evolve within and out of the main growth center, the "possibilities of the prevention of disease." The time and place for this would, therefore, be some available lecture or seminar periods in each of the four years of the medical course.

Still adhering to the ideal, I would support his hands by giving him a teaching associate or associates in those particular lines of endeavor that seem best adapted to the local conditions in my own school. It may be that there is readily available just the kind of man he and I want to present a concentrated exposure of our students to the principles and practice of epidemiology. I would get that epidemiologist, give him a laboratory in which to get to work on his own problems and then at the opportune time wangle a few hours from bacteriology, pathology or medicine in which he can meet with students in conveniently sized groups. I would feel, then, that preventive medicine was on its practical way.

If the professor of preventive medicine was clinically minded, as I should have foreseen, I would have him start very soon to insinuate himself into the teaching of other departments. Starting where he would fit most easily, he would participate in the activities of pediatrics, obstetrics and medicine; not merely as an observer, but as an actual performer in their teaching program. There are many aspects of each of these departments in which they could readily and happily use his help.

As time and opportunity presented themselves, the staff of the department of preventive medicine would be augmented by new additions to fit the needs. It might be necessary to supplement a professor with public health training with an associate professor who is strong on the clinical approach, or a clinically minded professor might need the early support of some one more qualified to present the special techniques and methods of public health.

If the amount of public health, public health administration, sanitation, epidemiology, etc., that should be given to undergraduates can be even loosely determined by this conference, as time goes on, each of these emphases would be added to my preventive medicine curriculum, as the whole department became more and more accepted in its own rights. I would not try to force its growth beyond the stimulating capacities of its nurturing staff.

Eventually, I would see that early in their course, probably in the first year, the students learned the rudiments of measurements in medicine, or biostatistics. If preventive medicine had the best man to do this, he would be given time, along with biochemistry and physiology, to teach it in a reasonable number of hours; or I would see that one of these basic medical science subjects taught sufficient biostatistics themselves. I would do the same with epidemiology in collaboration with bacteriology and medicine and correlated with their courses.

When it came to sanitation, public health administration, industrial hygiene and other specialized aspects of preventive medicine, I would add them to my staff and give them facilities for the pursuit of their own interests and research, and watch for the opportunity to obtain hours here and there from the total curriculum.

I have indicated that I would put biostatistics as early in the course as it can effectively be integrated with one or more of the basic medical science subjects. Epidemiology would go with bacteriology and the early studies in general medicine; sanitation techniques and principles would be brought in at some point after bacteriology and before the end of the third year when students are enlarging their scope of medical service. Public health administration, health codes and regulations, as applied to notifiable and communicable diseases and so forth, would be naturally taught as applied medicine and so brought into the third and fourth years; i. e., both years in order to keep the subject before them until graduation at least. Time for this should be taken by the department of preventive medicine, in part, and part in collaboration with medicine and on its time.

If effectively organized within itself, such a department of preventive medicine, as it grew and developed, would embrace a good research program and present sufficient opportunities for graduate teaching. Close liaison with the hospitals, particularly through appointment of members of the staff of the department as consultants or even directors of such divisions as hospital epidemiologist, sanitary officer, etc., would permit necessary extension of their influence and teaching to the hospital administration, staff, interns, residents and fellows.

Stepping down with humility from the lofty heights of dictator and assuming the more natural role of dean and the consequent limitations of that position, what could I do? Knowing that little money might be coming my way, and that the specialists I need might be long deferred, I would scan my faculty with a speculative eye, and see who among them I could use as a nucleus, not necessarily as a department of preventive medicine, but as a focal point for its beginning. I would probably find my man among the younger group in medicine or pediatrics, or less likely, in bacteriology, especially if I were to keep my mind on what I think is the main show, positive health.

If such a man could be found, I would try to start him off in much the same way as I did on the ideal setup. He would be encouraged to get around and spread his influence. I would certainly see that he learned what was going on and that he should be given an opportunity to show up the faculty, directly or indirectly, in their casualness toward the possibilities of prevention. He and I would see that some statistical work was given the students somewhere; that the control of communicable diseases was taught along with the study of those diseases in medicine; that nutrition, cancer control, general personal hygiene were adequately covered in the curriculum, albeit piecemeal by necessity; that environmental sanitation was presented and discussed at least, along with bacteriology, or if possible in conjunction with home visits in obstetrics and medicine, or any other department that utilized this method.

It would be our constant effort, with a special committee of the faculty, if desirable, to see that as many aspects as were considered in the ideal course are given their minimal consideration in this makeshift organization. I use the terms makeshift, not in a derogatory sense, but only to imply that it cannot, by its nature, be completely desirable. It can, however, be extremely effective and practical.

In this program, too, the emphasis on positive health, control of disease, and the special techniques of our over all subject would be spread throughout the curriculum, each facet facing the appropriate place in the curriculum where the students were concentrating their studies at the time. I make no apologies for lack of specficity of time and place in this review of the undergraduate curriculum. I believe we know now what should be taught in preventive medicine; we do not know how much or when each individual aspect of our program should be presented, but we know quite well with what they should be correlated, if not integrated. Our total program has become well crystallized as to content, but not as to procedure, and it would be well if we did not try too hard to set up too rigid limitations on the one hand, or too ambitious a program on the other.

It is still largely a question of each school for itself; each acting as it can and wishes in order, some way or another, "to permeate the entire curriculum with an entire program of health maintenance and prevention of disease."

The Integration of Teaching Content and Methods

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I have been assigned a definite subject for discussion in this symposium on the theory and practice of teaching preventive medicine to medical students. When one chooses his own subject, he at least knows what he is talking about; when a subject is assigned, he may:

1. Ignore the title and discuss the subject he had already planned, or

2. Attempt to fathom the mind of the assignor, and to present another person's ideas of a subject about which he himself knows little.

I have taken the second path. In doing so, it was necessary for me to establish a definition of the word *integration.* The word has a mathematical derivation from *integer,* a whole number. To integrate is "to make whole," and thus integration is a combination of activities that cooperate toward completion of a given task—to bring together the parts of a whole. The dictionary gives certain complementary definitions, such as "to complete," "to saturate," or, vulgarly, "to give a belly-full."

In my profound ignorance of matters pedagogic, I had no realization that integration had a special meaning in the educational field. In fact, it has been used so widely and so frequently that a diffusion in interpretation has occurred. It has become an abstract concept which each person translates into his own emotional rather than reasonable responses.

Pedagogically, it is generally used to describe teaching procedures which relate a variety of subjects to a unit of study.[1] But the term may be used to mean:

1. A correlation of separately taught subjects.

2. A fusion of previously separated subtopics in a central coherent core of study.

3. The finding of points of contact between different fields of knowledge, and the placing of special emphasis on these points, in the planning and presentation of subject matter.

The purpose of integration may be:

1. To add elements to the content of the curriculum with the intent of acquainting students with the defects in our contemporary social life.

1. We are indebted to the following authors for orientation in pedagogic concepts of integrated teaching:
Hopkins, Thomas: Integration: Its Meaning and Application (New York, D. Appleton Century Co., 1937).
Connole, R. J.: Integration in Present Day Curriculum Making (Washington, D. C., Catholic University of America, Publication of Dissertation, 1937).
Tyron, R. M.: The Place of History (Teaching) in a Program of Integration, *Elementary School Journal,* XXXIV (1934), 667.

2. To strive to bring about a correlation of subject material within the existing curriculum, thus demonstrating the unity of a given topic despite its "radial" interests and relationships.

3. To plan specific projects with the design and purpose of effecting faculty collaboration.

4. To re-orient the curriculum by focusing all study for a given period upon one selected subject.

5. To furnish the student the opportunity to synthesize various fragments of his newly acquired material with a well rounded complementary understanding of a given subject, as a unit.

INTEGRATION IN MEDICAL TEACHING

The time-honored system of the organization of medical school curricula and the method of selection of teachers makes it almost impossible to introduce correlation of subject matter in medical colleges. This is a rather didactic statement, but, perhaps, as you think it over, most of you will agree with it in principle. To use a nautical analogy, medical school teaching is divided into air-tight compartments. Many times this arrangement has carried the school safely through severe storms, but this type of structure does not lend itself well to streamlined design.

The function of each department of a medical school is to impart a special skill in a carefully delineated field. We assume that the minds of the students of the entering class are a more or less homogeneous mass of plastic, raw material which is to be put through a series of processes in order to produce a finished product. The dean of the school is the general manager of the factory. Under him are a series of divisional managers, each responsible for one special process. Each process must be completed before another can be undertaken. The unfinished product is checked and handled carefully, as it is transferred from division to division, with suitable points for rejection of defective products and flaws in parts.

The flow of the manufacturing process can be illustrated by a simple diagram.

As this diagram illustrates, clinical teaching is divided into conventional departments. The division is made largely on the basis of special skills, in a limited field:

1. Surgery, with its various subdivisions of highly specialized skills, e. g., orthopedics, neurosurgery.

2. Medicine, with (sometimes) special subdivisions of hematology, cardiology, endocrinology, etc.

3. Obstetrics and gynecology, limited (for the most part) to one sex and to consideration of one group of organs.

4. Psychiatry, a large division with exceptionally high walls, behind which much that is mysterious and incomprehensible prevails.

Certain organs of the body may achieve the rank of departmental consideration, e. g., ophthalmology, otology, dermatology, or dentistry.

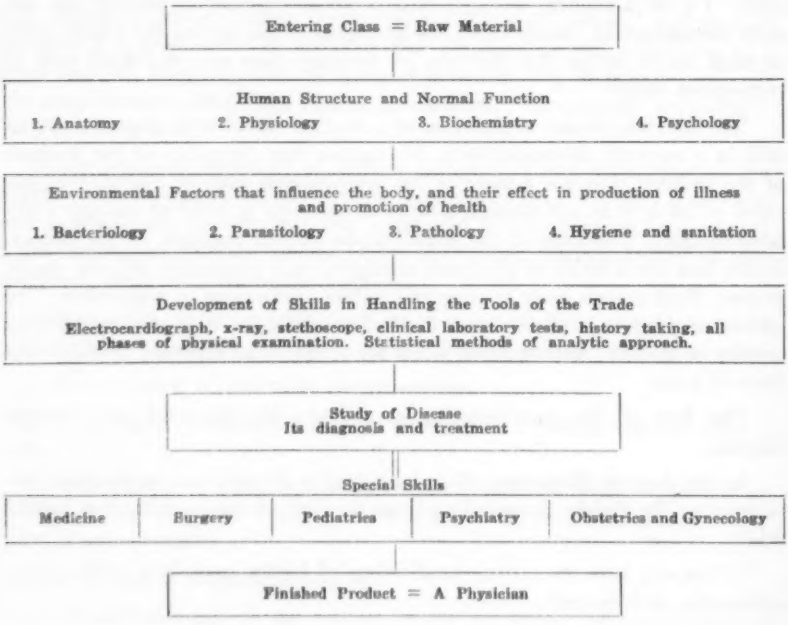
Finally, in a few instances, departments are organized solely for the study of one disease. For example, the department of syphilology, the department of malignant and neoplastic diseases, etc.

This type of teaching may be called functional teaching, based, as we have noted, on special skills, and placing emphasis on the understanding of a given disease.

PREVENTIVE MEDICINE

Then enters a new concept of teaching—the teaching of preventive medicine as a subject separate and apart from a study of the diagnosis and treatment of disease. Obviously, this concept is an invasion of all fields of established teach-

DIAGRAM OF THE FLOW OF TRAINING IN A MEDICAL COLLEGE


Entering Class = Raw Material
Human Structure and Normal Function
1. Anatomy
2. Physiology
3. Biochemistry
4. Psychology
Environmental Factors that influence the body, and their effect in production of illness and promotion of health
1. Bacteriology
2. Parasitology
3. Pathology
4. Hygiene and sanitation
Development of Skills in Handling the Tools of the Trade
Electrocardiograph, x-ray, stethoscope, clinical laboratory tests, history taking, all phases of physical examination. Statistical methods of analytic approach.
Study of Disease
Its diagnosis and treatment
Special Skills
Medicine
Surgery
Pediatrics
Psychiatry
Obstetrics and Gynecology
Finished Product = A Physician

ing. It is not introduced on a functional basis; no new or special skill is added to the student's armamentarium. It is not a new diagnostic tool, nor a new method of treatment. Rather it is the introduction of a *point of view*, which has as a primary consideration *health* instead of disease. It is more interested in the amelioration of factors that produce illness, than in illness itself.

It considers man as a social being, as part of a family, and as one who is affected profoundly by his environment. It introduces the idea that health and well being may be influenced by certain favorable factors which tend to promote optimal living conditions, and, contrarywise, that disease may be produced by unfavorable environmental factors which are subject to abatement and relief. That is to say, this department is concerned with the promotion of factors that tend to produce good health, and has little primary interest in disease, *per se*. Furthermore, it introduces the concept that the teaching of preventive medicine, in order to be effective, must become an integral part of the teaching of curative medicine.

It requires no great foresight to anticipate that this newest of all the departments of medical teaching must, because of its concepts, meet vigorous opposition from all well established departments of medical teaching, for most obvious reasons. It is an encroachment on other soundly established departments of teaching. It requires that they sacrifice some of their allotted teaching time, with rearrangement of subject matter, and with changes in the curriculum. Furthermore, departmental teaching means, in essence, that each field is clearly delineated, and well assigned, and that there should be no reason for overlapping of subject presentation. Each department must keep on its own side of the fence.

The old concepts of teaching hygiene to medical students, by lectures and demonstrations in environmental sanitation, encroached in no manner upon other departments, since it had no direct relationship to medical practice. It was tolerated kindly, perhaps, often, contemptuously; usually with the greatest of indifference.

Suddenly the new concept of teaching preventive medicine brought a realization that a dangerous and unforeseen situation had arisen. The new department was interested in subject matter that related to all other departments, from physiology and bacteriology to surgery and obstetrics. It was attempting to interrelate departmental teaching, to integrate subject matter, and to put together parts to make a whole. Furthermore, it presented none of the accepted criteria for the establishment of a separate department. It had no particular unit of study; it brought no new and special skill; it dealt with many and diverse topics, from tropical medicine to sociology, with no particular expertness in any one field. It was neither clinical nor preclinical, nor was it halfway between.

As we have anticipated, the result of this realization was an immediate resentment from long established departments toward preventive medicine. The justifiable feeling arose that "health" personnel were in great part quite ignorant of modern advances in clinical medicine, and were encroaching on fields with which they were not familiar.

Integration of teaching also represented criticism of existing clinical teaching. Thus the major objections to integrated teaching, as it has been proposed by departments of preventive medicine, may be summarized briefly:

1. The department of preventive medicine was encroaching on well defined and well established divisions of university teaching.

2. "Integration" tends to break down departmental boundaries and thus diverts the student from the great importance of each special field.

3. The plan places too great emphasis on theoretical materials, with lack of practical balance in the teaching program.

4. Integration weakens research, which can only be undertaken successfully in firmly established special departments.

5. It instigates against proper training in special fields. "The surgeon should have training in surgical skills—not in sociology or statistical technique." (We were discussing the subject around the luncheon table not very long ago and one of the members of a special department said: "When a sociologist crosses the threshold of this medical school, I go out the window." He was perfectly sincere about it, and I did not inform him that there had been a sociologist on my staff for the past eighteen months.)

6. Incorporation of preventive medicine in clinical teaching is not a special activity of one department of a medical school. Rather it is the responsibility of each functional department to teach prevention of disease as part of its own instruction.

Most of these objections to the concepts and to the work of the department of preventive medicine have some justification and validity, and put the department of preventive medicine on the defensive. I was impressed again yesterday and today with the fact that most of us seem to be on the defensive in this question of the teaching of preventive medicine in medical schools; perhaps because of the reasons that I have just outlined. Can we exist as a separate department of the medical school? Can we carry out an effective program within our plan of "integrated teaching"? Under the existing system of medical teaching, and with the present plan for selection of teaching personnel, it seems most logical that our existence as a separate department is dependent on our providing some special skills and some special knowledge, or special teaching techniques, that are not encountered in other teaching departments of the medical school.

If the department does provide some of these special skills, then it will win recognition from its colleagues, and gain the respect of the student body; otherwise it will not.

What, then, is the special place that the department should make for itself in student teaching?

A. ENVIROMENTAL SANITATION. This subject must be taught well by the department of preventive medicine. It is an essential part of a good medical education. But it bears little direct relationship to clinical medicine, and if overemphasized, it will relegate the department to a minor role in student teaching.

B. STATISTICAL TECHNIQUES. These are intended primarily to aid the phy-

sician in testing statistical validity in the interpretation of clinical data. This subject might be taught by any preclinical department. Usually, and quite logically, it is assigned to preventive medicine. It is one sound reason for a separate department.

C. EPIDEMIOLOGY. The study of the natural history of disease. This is the subject matter most frequently assigned to departments of preventive medicine, and in which highest specialized skill has been developed. It is an excellent foundation for the department, but it has the disadvantage that it encroaches on all the other departments of clinical teaching.

D. SOCIAL AND ECONOMIC FACTORS. A study of the social and economic factors which have an influence on etiology and treatment of illness. This new and important approach to medical teaching may well become the most effective "special skill" of preventive medicine. As yet few persons are available who are prepared to assume the necessary leadership in this field. (Some colleges, notably in England, plan to institute a special and separate teaching department for this subject.)

Once the department of preventive medicine is firmly established as an entity, with full recognition by faculty and students, it is in a position to develop its teaching along lines that seem most effective and appropriate. It is my firm belief that best results can be achieved by the integration of subject material. But it is also my concept that the integration must take place in the mind of the student. Thus integration becomes a personal matter: an individual reaction which is dependent in great part on the natural ability of the student to grasp the component parts of a subject and synthesize them himself. A coordinated arrangement, by the faculty, of subject matter is simply intended as a means of facilitating the understanding of relationships by the student body.

I also believe that attempts to correlate curricula may result simply in an elaborate and highly intricate mechanism that defeats its own ends. This certainly will be true unless the whole faculty has accepted a central, uniform goal, and has achieved a unanimity of opinion as to the primary purposes and methods of achievement in student instruction. In other words, an integrated curriculum can operate satisfactorily only when the teaching force has already achieved, to a high degree, a general agreement concerning the functions of teaching. This is almost impossible of achievement under our present plan of selection of medical school teachers, for they are chosen (we repeat) on the basis of special skills, within a relatively limited field.

Therefore, our definition of the function of preventive medicine in the integration of teaching must be: To furnish the student with the opportunity to synthesize, for himself, the various fractions of his recently acquired information upon any given subject into a well formulated and comprehensive unit of knowledge of that subject, and to relate each one of these subjects to the other, in proper proportion.

ILLUSTRATIONS OF COORDINATED TEACHING

Communicable Disease. Marietta, an Italian girl, aged 17, entered the medical service of the hospital with an obscure but very serious infection. She had been ill for only a few days. The disease proved to be generalized tuberculosis. Tuberculous meningitis developed, and she died. An autopsy was performed. The clinical and pathologic aspects of the case were discussed in great detail at the clinical-pathological conference. The representative from preventive medicine, when asked to comment on the case, pointed out that this girl must have had a recent infection, and that the source, in all probability, was near at hand. It might even be in her immediate family. Obviously, it was a dangerous focus of infection, and should be investigated immediately.

A third year student from preventive medicine was assigned the task. He visited her family. Father, stepmother and five brothers and sisters were all brought to the health center for an x-ray of the chest. The results were negative. The girl's mother had died when she was 10 years old. Hospital records were investigated and they showed that rheumatic heart disease was the cause of the mother's death.

The patient had left high school the year before, at 16 years of age, and had secured work for the past year in a button factory. This proved to be a small, badly ventilated and overcrowded loft, with a manager and a personnel of thirty-two employees. The medical student could get no further in his investigation, but the department of preventive medicine, through its contacts with the health department, was able to secure an x-ray of the chests of all the factory employees. Three cases of active pulmonary tuberculosis were uncovered. One, a man of 45, with positive sputum, had worked on the next bench to our patient who had died. Suitable measures were followed to care for these newly discovered cases of tuberculosis and to examine patients' families. The data were reported at the next clinical-pathological conference by the student investigator, and the information placed on the hospital case records.

Social Aspects of Medicine (Family Studies)

This interrelated teaching involves chiefly the departments of preventive medicine, nutrition, and social service. If special need for treatment arises, then any other departments of the hospital may be asked for aid, from pediatrics to psychiatry.

The student is assigned to study a family which has been selected by the public health nurse who makes home visits in the district. The reason for entrance to a home is usually some specific health problem. It may be prenatal or postnatal care, tuberculosis in the family, school maladjustment of a child, or for another reason. The student makes a detailed study of the social and economic factors that tend to promote good or ill health in the family. He makes an analysis of the food intake of one member of the family, as representing the nutritional status of all. He consults with the nurse, the hospital nutritionist and the hospital social service worker, and develops his recommendations for family improvement. If special need exists, such as dental care, orthopedic consultation, eye examination, etc., it is his duty to find where the necessary resources exist, and to make them available to the family.

Coordinated Clinical Exercises in Preventive Medicine

A series of clinical exercises are planned for the fourth year students. Each of these one hour discussions is conducted by a clinician. The leader has been assigned three or four students, who present clinical cases that illustrate the points the leader wishes to bring out in the discussion. The subjects range through all departments of the medical college: allergy and hay fever, early diagnosis of cancer, diabetes and obesity, alcoholism (discussion led by a psychiatrist),

malnutrition in the elderly person, heart disease, prevention of blindness, etc. These exercises are planned by the department of preventive medicine, but conducted by clinicians. They give the students a real opportunity to synthesize preventive and curative medicine.

Joint Faculty Appointments

One of the simplest methods of interrelating teaching is the method of giving appointments to the staff, and fellowships as well, on a joint basis. For example, we have at present:

1. A joint appointment of a fellow in the departments of psychiatry and preventive medicine. This fellow is working in the field of mental hygiene of the adolescent.

2. A joint appointment in pediatrics (instructor). This physician works in the hospital and also in the health center well baby clinic service.

3. A joint appointment in the departments of medicine and preventive medicine. This instructor is a clinical expert in tropical medicine.

4. In addition, members of the staff, of professional rank, in the department of preventive medicine have, in almost every instance, been given hospital appointments in medicine, pediatrics, hospital administration, or in other divisions of clinical and hospital work.

The Health Service

One of the best places to teach preventive medicine is in a well organized health service. In our institution, a health service, including prepaid provision for hospital care, has been organized as a unit of care for medical students, student nurses, graduate nurses, interns and residents of the hospital, employees of the hospital and of the medical school. Benefits are given to nearly three thousand persons.

The chairman of the health service committee is the professor of preventive medicine. The director of the service has a teaching appointment both in medicine and in public health. He is a full time employee. This plan offers an excellent opportunity for student training in all phases of preventive medicine.

We mention these few illustrations of integrated teaching simply as examples of the use of old facilities, or the development of new facilities, for teaching in our institution. Obviously, each department of preventive medicine must develop its own plan in accordance with its own facilities, and through the particular genius and interest of the professor of preventive medicine and his associates.

As I stated at the outset, the essential thing is first to establish firmly the department as a special entity which brings special skills to student teaching, and then to develop integrated teaching slowly and gradually within the available resources of the medical college, the teaching hospitals, and the public health resources of the community.

SUMMARY

1. Under our present system of teaching organization in American medical colleges, an integrated curriculum for teaching preventive medicine is difficult of achievement, and tends to defeat its own ends.
2. The integration of preventive medicine with clinical medicine is a function of the student's mind. He must learn to synthesize the component parts of a subject that are presented to him, and mold them into a complete unit of knowledge.
3. The department of preventive medicine must provide certain special skills and teach certain assigned and specified material that are generally recognized as its province, and that are not provided for in any other university department. Thus it will win recognition and respect for the department.
4. The department must consider as its major developmental task, that it should provide suitable material to the students, in logical order, and of obvious personal interest, so that the student will himself be able to integrate the principles of preventive medicine in the acquisition of his knowledge of clinical medicine.
5. Each department of preventive medicine should develop its own facilities, use its own methods, conduct its own teaching experiments, in a variety of fields, in order to utilize to best advantage its special opportunities for the improvement of the teaching of preventive medicine to the student body.

JOURNAL
OF THE
Association *of* American Medical Colleges

Volume 22 MAY, 1947 Number 3

Future of Medical Education

The presidents of nineteen universities having medical schools met in Rochester, New York, in March. They discussed the future of medical education, stating that medical care and public health depend on it. This discussion correlates with the papers on financing medical colleges read at the 1946 meeting of the Association; hence the resume received from Mr. Alan Valentine, president, University of Rochester, is published herewith to stress the importance of this problem.

"We feel it our duty, as presidents of universities with medical schools, to inform our fellow citizens of the uncertain future of medical education.

"We who sign this statement represent only our own institutions, which comprise but a fraction of the medical schools of the country. Our sense of the immediate need of a statement of our own views, and our reluctance to initiate any effort which might be regarded as a nation-wide campaign, preclude at this time an attempt to associate all institutions of medical education with this statement. We do not speak for them or for associations representing medical education, but we have reason to believe that they would support our views.

"Recent years have brought certain notable advances in medical knowledge and care, including penicillin, sulpha drugs and blood substitutes. Those advances may have given the public the impression that future progress in medical care, and the maintenance of high qualitative standards in medical education, are assured.

"Such is not the case. New hospitals and clinics, new drugs, medical insurance plans and state subsidies to medicine do not in themselves assure proper medical care. They must be widely used by an adequate number of skilled physicians. It is only through the hands and minds of men and women trained by our medical schools that society can be given sound medical care and new developments utilized. The future of medical care and public health depends upon medical education.

"The present provisions for ensuring a continuing supply of well trained physicians are inadequate. They are inadequate because the medical schools which provide that supply are inadequately supported in terms of future needs. Few if any of the seventy recognized medical schools in the United States can be confident, with present resources, of maintaining in the future their programs at the essential high level.

"Forty-three of these seventy schools are maintained solely by income from private endowment, private gifts and tuition fees from students. Many of the endowed schools are of the first quality. They furnish friendly competition in excellence for the best of the tax-supported schools. They have set the pace for medical education. American society cannot neglect their future.

"Even the twenty-seven schools wholly or partly supported by taxes depend upon private sources for important parts of their programs.

"Good medical education is the most expensive form of professional training. It requires a large number of skilled teachers in proportion to the number of students. It needs expensive plant and equipment, with hospital facilities immediately available. It involves generous provision of teacher's time, and funds for research. As medical knowledge becomes

more extensive, the costs of imparting that knowledge mount. Most of the costs cannot be paid by the medical students and tuition fees are already as high as most students can pay. Expenses of medical schools run as high as $4,500 or more per student per year. The costs which make up this total have constantly mounted and will probably continue to mount. Meanwhile income from invested funds seems likely to remain low.

"These costs of medical education must be met if it is to be maintained at the level necessary to ensure proper medical care. In private institutions they can be met only by large increases in endowment funds, or long-term gifts, or both.

"Over the past fifteen years private support of medical education has not been regularly maintained. Three or four medical schools came perilously near to closing during that period. Many medical schools were forced to abolish certain teaching positions, to reduce teachers' salaries and important medical services, to restrict promising research, and to make very heavy demands upon the time and energy of doctors, nurses and hospital staff, and to forego normal growth and improvement.

"During the war period medical teaching staffs were greatly reduced, and they have not yet been adequately restored. The year-round teaching program of the war left faculties, nurses and technicians often too tired to teach or handle research at normal efficiency. The war brought an accelerated program of medical education, and the necessity of war service also deprived many young doctors of normal opportunities for graduate medical training. The remarkable manner in which some young men have overcome these handicaps is striking evidence of their energy, devotion and ability, but the fact remains that many young doctors did not receive during their years of military service the clinical experience best suited for their professional development, and are now less qualified for advanced teaching than would otherwise have been the case. These men would normally carry a large share of medical research and teaching in our medical schools. The fact that they have not been able to do so to the desired extent is no reflection upon them, but demonstrates that our medical schools have not qualitatively recovered from the war period. Moreover, new and proposed medical schools could be properly staffed only by drawing upon the already impaired staffs of existing schools, to their further detriment.

"Although grants for research are currently available from government, industry and other sources, such grants ease little if at all the operating costs of medical schools. Acceptance of such grants, sometimes in the hope of strengthening budgets, may drain the necessary personnel from essential medical teaching. At best they provide only temporary relief in certain fields. To secure and retain able and inspired research workers, medical schools must offer better salaries, stronger assurance of continuance beyond brief periods, and a less harassed environment for research.

"Foundation aid to medical schools has been of great value, but most of such aid applies to specific purposes and cannot be used for general support. The total sum available from all such foundations probably does not exceed $4 millions per year, which is but a small fraction of the annual total operating budgets of the medical schools of the nation.

"Great new opportunities related to human welfare challenge our medical schools, but under present conditions few of these opportunities can be accepted. Though our battle casualties were thirty per cent to forty per cent psychiatric, there are not five medical schools in the United States with departments of psychiatry adequately endowed. Industrial medicine, preventive medicine, the important field of medical sociology remain undeveloped for lack of funds and trained experts. There is hardly an exemplary department of dermatology in the country. The organization and development of pharmacological teaching languishes for lack of support. Tropical

medicine, so obvious to our recent and future responsibilities, remains relatively unexplored.

"Unless existing conditions are quickly changed, medical education will decline in quality, and medical research will falter.

"Several leading medical schools have recently concluded that they will need twice their current income merely to maintain on a reasonable level their present endeavors. They will need more than that to realize new opportunities and explore new fields. Certainly the annual budget of our medical schools as a whole must increase by at least fifty per cent if they are to perform properly their essential functions.

"The total spent by all medical schools, net after balancing gross operations, is about $25 millions per year. This is a small sum in terms of the billions Americans contributed without hesitation toward another form of national defense.

"Medical education is, of course, not the only form of higher education which is presently in need of further support. Probably all higher education, especially beyond the collegiate level, will need vastly increased support from American society during years to come, to provide those additions to knowledge and human understanding essential to the strength, the world service and the world leadership required of our nation. But the welfare of medical education is obvious and paramount to the actual health and well-being of every citizen, and we speak for it here with special emphasis.

"We believe that if this situation is clearly understood by our fellow citizens, they will rally to the support of medical education. Through private support American medical schools have set a standard for the world. Private support should not onw abandon them through ignorance of the facts, temporary uncertainties, or absence of mind. We warn our fellow citizens that without their prompt and generous aid our medical schools, through their graduates, cannot be expected to safeguard the future health of American citizens and their children."

Those in attendance at this meeting were: Robert G. Sproul, president, University of California; Frank Diehl Fackenthal, acting president, Columbia University; Edmund Ezra Day, president, Cornell University; Robert L. Flowers, president, Duke University; James B. Conant, president, Harvard University; Virgil M. Hancher, president, State University of Iowa; Isaiah Bowman, president, The Johns Hopkins University; Alexander G. Ruthven, president, University of Michigan; James L. Morrill, president, University of Minnesota; Harry Woodburn Chase, chancellor, New York University; Franklyn B. Snyder, president, Northwestern University; George Wm. McClelland, president, University of Pennsylvania; Alan Valentine, president, University of Rochester; Donald B. Tresidder, president, Stanford University; Rufus C. Harris, president, Tulane University; B. Harvie Branscomb, chancellor, Vanderbilt University; Arthur H. Compton, chancellor, Washington University; Winfred G. Leutner, president, Western Reserve University; Charles Seymour, president, Yale University.

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Council on Medical Education and Hospitals
American Medical Association

The Board of Trustees of the American Medical Association has appointed Dr. Donald G. Anderson of Boston secretary of the Council on Medical Education and Hospitals, effective July 1, 1947. Dr. Anderson is dean of the Boston University School of Medicine. He is a graduate of Harvard College and received the M.D. degree from Columbia. He has had hospital and academic appointments at Boston City Hospital, Presbyterian Hospital in New York, Evans Memorial and Massachusetts Memorial Hospitals in Boston, and Columbia. During the war he was associated with Dr. Chester Keefer in penicillin

research for the Office of Scientific Research and Development. His research publications deal primarily with the employment of the sulfonamide drugs, penicillin and streptomycin in the chemotherapy of infections.

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Committee on Personnel Practices

This committee was appointed at the Pittsburgh meeting. It was charged with the duty of evaluating existing tests used to determine the fitness and aptitude of applicants for admission to medical school for the study of medicine and to develop a test which would be of value to all medical schools. The personnel of this committee consisted of Dr. Carlyle Jacobsen, then assistant dean of the Washington University School of Medicine, now dean of the Graduate School of the State University of Iowa; Dr. George Packer Berry, assistant dean of the University of Rochester School of Medicine, and Dr. E. F. Lindquist of the State University of Iowa faculty.

The committee reported at the 1946 meeting of the Association and was empowered to proceed with the plans outlined (see minutes of proceedings of that meeting). As a result the Carnegie Graduate Record Examination Board gave a test examination for the Association on January 11, 1947. The test was taken by about 14,500 students. The results of the test have been sent to all member medical colleges. On the suggestion of the committee, the Carnegie Board will hold similar examinations in 1948 and 1949 by which time the committee feels that it will have developed a test of its own to be administered either through the agency of the committee or some other organization such as the Carnegie Board.

The committee is now in process of full organization. Five additional members have been added to the committee: Joseph Mullin, University of Chicago; Robert Harris, University of California; H. A. Shoemaker, University of Oklahoma; John Charles, University of Rochester, and Arley Bock, Harvard University. Dr. Dewey Stuit, of the psychology department of the State University of Iowa, has been appointed director of study.

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Audiovisual Education

Elsewhere in this issue is published the preliminary report of the Committee on Audiovisual Education which was appointed at the 1946 meeting of the Association. The personnel of this committee is: Dr. W. A. Bloedorn, dean, George Washington University School of Medicine; Dr. Joe Markee, professor of anatomy, Duke University, and Dr. R. P. Walton, professor of pharmacology, Medical College of the State of South Carolina. The committee has met and discussed plans of procedure. Dr. Bloedorn, the chairman of the committee, has met with representatives of the Army, the Navy, the Public Health Service and the Veteran's Administration which constitute a joint departmental committee. All these agencies are vitally interested in this problem. This Association was chosen by the government group to be the working agency which will carry out the plans already made. It is hoped that the medical schools will interest themselves in this problem and take an active part in helping to bring it to full solution by giving financial support which is needed before the plan can be made operative. Of course, any one is privileged to give help, especially the Foundations which have done so much already over a long period of years in the interest of public health and medical education.

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Evaluation of Foreign Credentials

The evaluation of credentials of applicants coming from foreign countries who are seeking admission to medical schools or State licensing examinations has always been a problem, because of the lack of definite information on foreign colleges and medical schools. Inasmuch as a number of organizations are interested in this problem, a meet-

ing of representives of these organizations was called in Chicago on February 9. The following agencies concerned with this problem were represented:

Association of American Medical Colleges

Advisory Board for Medical Specialties

Federation of State Medical Boards

National Board of Medical Examiners

United States Office of Education
State Department of the U. S. Government

New York State Education Department

Council on Medical Education and Hospitals of the American Medical Association

The agencies represented outlined current practices in the evaluation of foreign credentials. These policies in essence are as follows:

The Association of American Medical Colleges and the Council on Medical Education and Hospitals have adopted the following policy regarding foreign students desiring to enter approved medical schools in this country, with or without advanced standing:

When an approved medical school desires to consider an application from a student presenting credentials from a foreign university for admission with or without advanced standing, the following uniform procedure should be employed:

1. That only credentials sent directly from the foreign school to the American school be considered.

2. That the applicant meet the admission requirements of the school to which he is applying and that his credentials be evaluated, preferably by examination, by the faculty of the arts college who appraise transcripts of records or by the usual agency of the medical school.

3. That medical school subjects be evaluated, preferably by examination, by professors who teach those subjects in the medical school to determine the competency of the applicant in those fields.

4. That not more than two years of medical credit be allowed for work done in a foreign school.

5. That the candidate be advised that meeting these requirements and graduation be no assurance that he will be eligible for licensure in the United States.

6. That applicants from a foreign university for the freshman class be requested to take one year of premedical work in an approved American college of liberal arts before being given consideration for the study of medicine.

Although no positive recommendations emerged from the discussions, it was the consensus of the group that our educational resources at the undergraduate level are not so extensive that we can encourage significant numbers but at the graduate level we do have resources under normal conditions. Some of the extra places established by hospitals for veterans might well be used later for training of foreign physicians.

It was agreed that a program be initiated in which there will be a preliminary survey of the field as related to the location of each school. Thereafter there might be obtained certain factual information from publications of the schools and from the cultural attaches of the State Department. A questionnaire could then be sent to each school requesting such significant data as premedical requirements, enrolments, faculty members, duration of course, licensure in the country. The result would be the obtaining of basic objective information about each school. Evaluations might then be attempted from other sources. Whether an approved list of foreign schools will emerge from this project is problematical. The material obtained however should materially aid many bodies seeking such data. No survey of medical schools as is done in the case of medical schools in the United States and Canada is foreseen.

Criticism of Teaching Methods

Many persons in various fields of education apparently are becoming interested in teaching. In a recent issue of *Hospitals* (21: 33, Apr., 1947) Dr. Fred G. Carter, superintendent St. Luke's Hospital, Cleveland, contributes an article titled "Thus We Fumble in Our Teaching Methods," in which he makes the following comment about medical school teachers:

"The responsibility of training men and women to practice the various specialties of the medical field is one that hospitals have accepted in the past and one which they must accept in greater measure in the future if the country is to have capable practitioners. There is no other place to train them. . . . Much apprentice time has been wasted because of poor planning. Definite curricula have not been set up and followed and this means that course content has not been studied carefully, has not been properly evaluated and proper plans have not been formulated to insure uniform, well rounded training. All these trainees have studied the basic sciences of medicine and have been given an introduction to clinical medicine as medical students, but we haven't arranged to carry them forward as systematically as we might into the practical applications of their knowledge to clinical problems and techniques.

"To do this job creditably and efficiently, we need good teachers and sound planning. The war effort demonstrated clearly that a great deal of time could be conserved and a better end result insured through well conceived, properly organized instruction effort. Perhaps it won't be out of place for me to call attention at this point to what I conceive to be the outstanding weakness in all university and advanced teaching. This is the employment of teachers who are ill-prepared or not prepared at all for teaching responsibilities. No matter how clever a man may be as a clinician or a researcher, he is not necessarily a good teacher of clinical medicine. Even if he is a reasonably good teacher, I have every reason to believe that he would be a better one if he had something more than a speaking acquaintance with pedagogical method.

"I have often wondered why a university will insist that its students who would teach in the primary and secondary schools must pursue certain courses which fit them to do creditable work in their teaching field, yet when it comes to selecting for their own faculties they sometimes throw almost all pedagogical requirements out the window and select men with research talents. Many of these are totally incompetent as teachers. The good teacher is accorded little or no recognition in comparison with the faculty member who has been able to contribute something in the way of research to his field, yet the well qualified teacher probably could stimulate more worthwhile research among his students than he himself could ever accomplish as an individual. Our medical specialty boards are much more inclined to stress periods of service in their requirements for board recognition than they are to emphasize quality and efficiency of teaching and details of course content."

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U. S. Army Board on Nutrition

At the request of the Surgeon General of the Army, his consultants in nutrition decided to establish a Board which will give consideration to and devise methods and procedures for the certification of nonmedical experts in human nutrition. This Board will be composed of representatives from agencies concerned with human nutrition. These agencies are: American Medical Association; American Institute of Nutrition; American Society of Biological Chemists; American Public Health Association and the Association of American Medical Colleges.

Dr. Frederick J. Stare, associate professor of nutrition, Harvard Medical School, will represent the Association of American Medical Colleges.

The 1947 Meeting

Notice has already been given that the 1947 annual meeting of the Association of American Medical Colleges will be held in Sun Valley, Idaho, October 27, 28 and 29. Many of the attendants at this meeting will come from geographic areas which will necessitate coming through Chicago en route to Sun Valley. If a sufficient number of persons go that way, it will be possible to have special cars or, perhaps, even a special train which will leave Chicago October 24 at 2 P. M. via the Chicago & North Western and Union Pacific Railroads. This train will arrive in Sun Valley October 26—Sunday—some time in the morning. Any one wishing to avail himself of this opportunity of traveling in company, should notify the Secretary of the Association at once, indicating the Pullman reservation desired. The railroad would like to have this information not later than the end of May so that proper arrangements for special cars or train can be made.

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Dr. Victor Johnson

Dr. Johnson has been appointed director of the Mayo Foundation for Medical Education and Research. He assumed his new duties April 1. Dr. Johnson will also serve as professor of physiology in the University of Minnesota. Dr. Donald C. Balfour, formerly director of the Mayo Foundation, will become director emeritus.

College News

Northwestern University Medical School

Gifts amounting to $60,000 have been received for the establishment of an Institute for the Study of Rheumatic Fever. The grants, comprising $45,000 from the U. S. Public Health Service, and $15,000 from the American Cyanamid Company, Lederle Laboratories division, represent initial funds for the project, which will require the full time services of at least nine experts, including Dr. Alvin F. Coburn, who will be director of the institute.

The Rheumatic Fever Institute and its laboratories will be housed on one entire floor being set aside in the Municipal Contagious Disease Hospital in Chicago. The ultimate objective of the proposed studies will be the development of methods for prevention and treatment. The immediate objective will be to gain new knowledge of the disease's mechanism.

It is planned to set up eight units in the institute, four in biology and an equal number in chemistry, with a distinguished, experienced investigator to head each unit. The biology units will include the fields of bacteriology, immunology, pathology and physiology; the chemistry divisions, biochemistry, immunochemistry, enzyme chemistry and, perhaps, organic chemistry.

In conjunction with the fundamental research work, the institute will have the services of additional investigators to engage in clinical research in collaboration with hospitals concerned with the care of rheumatic children. The staff's experts will be recruited from both the United States and abroad, and will devote full time to the work of the institute. It is expected that the laboratories and other facilities will be completed and ready for operation by July. Dr. Coburn, until his appointment as director of the institute, was assistant professor of medicine in the College of Physicians and Surgeons of Columbia University.

Northwestern is now affiliated with the Children's Memorial Hospital. The hospital staff and the faculty of the medical school will cooperate in research and teaching related to pediatrics. Further correlation of the work of the two institutions has been arranged, with senior medical students serving part time in observation at the hospital, and staff members of Children's Memorial using the Northwestern laboratories for research.

A gift of $10,000 has been received from Mr. and Mrs. Leon Mandel for research on tuberculosis. To be known as the Leon and Carola Mandel Fund for the Study and Treatment of Tuberculosis, the grant will be used for clinical research in the pathology and physiology of tuberculosis, with emphasis on the relation of nutrition to the disease.

Expanded studies at Northwestern University Medical School, to aid in the determination of the effectiveness of streptomycin in treatment of tuberculosis, will be supported this year by a grant of $25,000 just received by the school from the United States Public Health Service.

The grant gives recognition to more than three years of experimental research on the therapy of tuberculosis which has been carried on at Northwestern under the direction of Dr. Guy P. Youmans, associate professor of bacteriology. Of the many agents thus far investigated, the antibiotic, streptomycin, shows the greatest promise. This antibiotic acts by preventing growth of the tubercle bacillus within the body.

The work will be part of a program sponsored by the National Tuberculosis Association and the American Trudeau Society, the clinical branch of the former organization, and the Public Health Service. The research at Northwestern

will be centered in studies of the use of the antibiotic in experimental tubercular infections and the effect of streptomycin and other agents on the growth of tubercle bacilli.

The laboratory at Northwestern will be one of three centers in the United States set up to evaluate, standardize and correlate data supplied by clinical investigators working in hospitals designated by the two tuberculosis associations. Proposed studies will aid such investigators in determining the sensitivity to streptomycin of strains of tubercle bacilli isolated from hospital patients. Dr. Youmans, who is chairman of the laboratory subcommittee on streptomycin of the American Trudeau Association, will be director of the Northwestern research project. Working with him will be two bacteriologists and four assistants.

Another step toward the $100,000,000 medical center now being established on the Chicago campus of Northwestern University was realized. Dean Miller announced receipt of the first of several gifts, expected to total more than $500,000, for the creation of a fund to facilitate expanded research in the field of venereal diseases, other public health problems and medical education. The initial gift of $190,172, with others to follow in succeeding months, has been made to the university from assets of the Public Health Institute of Chicago, which ceased operation early this year after 26 years of service.

Both the principal and income from the half million dollar fund will be employed for research as well as treatment and examination of patients in the medical school clinic. Equipment and other physical property of the institute also are to be turned over to the university to be used in connection with the fund.

Great progress already has been made in developing Northwestern's medical center. Erection of a neuropsychiatric hospital is assured through a bequest of $1,500,000 from the late Mrs. Joy Morton. The Veterans Administration soon will build on the Chicago campus a 600 bed cancer hospital, which will be the finest institution in the world for the study and treatment of cancer. Mercy Hospital, oldest institution of its kind in the Chicago area, has purchased land adjacent to the campus on which it will erect a $10,000,000 hospital. Other hospitals, now located in various parts of Chicago, likewise are planning to move to or near the Chicago campus.

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George Washington University
School of Medicine

Grants for medical research totaling about $150,000 have been awarded the medical school. Largest grant is one for $40,000 of public funds for research in anesthesia and the use of penicillin and streptomycin in antibiotics. Those engaged in this project are Dr. Brian B. Blades, professor of surgery and administrator of the medical school research program; Dr. Lloyd Mousel, clinical professor of anesthesiology; and Dr. Monroe James Romansky, associate clinical professor of medicine.

Six projects are being directed by Dr. Paul K. Smith, professor of pharmacology. These are: a study of drugs for treatment of typhus fever and Rocky Mountain spotted fever for the Navy; a study of drugs for treatment of rheumatic fever for the Institute for Study of Analgesic Drugs; a study of drugs that show some promise of impeding tumor growth for the National Cancer Institute; a study of the toxicity of drugs used in arthritis for the American Medical Association; a study of the use of demerol for morphine for Winthrop Chemical Company, and studies of drugs for relief of muscle spasms for Billhuber-Knoll Company.

Penicillin research for the Lederle Laboratories is being conducted by Dr. Harry F. Dowling, clinical professor of medicine, who is studying treatment of various infections with penicillin, new preparations of penicillin, and treatment of various infections with streptomycin.

Under the supervision of Dr. Errett C. Albritton, professor of physiology, a contract with the U. S. Public Health

Service is being executed to study endocrine factors in the self selection of diet by rats and the validity of self selection of diet by rats as an instrument with which to investigate metabolism of the animal.

Research in hypertension is being continued by Dr. Paul F. Dickens, clinical professor of medicine, under a grant from the Cecelia Cummings Fund set up by Homer S. Cummings, former Attorney General of the United States and a trustee of George Washington University.

A grant to assist Dr. Joseph H. Roe, professor of biochemistry, in continuing research on the methods for the determination of Vitamin C in plant and animal tissues has been made by the Nutrition Foundation, Inc., of New York.

Under a contract with the department of surgery, Dr. Jacob J. Weinstein, associate in surgery, is directing an investigation of protein metabolism in surgical diseases and use of protein therapy in pre- and postoperative care of surgical and allied diseases.

A number of special studies are being carried on by private donations for special studies in cardiovascular disease under the university's Cardiology Research Fund. These include studies involving use of multiple and special leads in taking electrocardiograms by Dr. Benjamin Manchester, associate in medicine, and Dr. Clayton B. Ethridge, assistant clinical professor in medicine: a paper just completed by these two doctors in collaboration with Dr. Irving Wolfe Winik, associate in medicine; work being continued concerning use of newer type drugs in the treatment of vascular diseases; and a new method for producing prolonged local sympathetic nervous system block by iontophoresis by Dr. Manchester.

Other research being carried on by grants from the university includes a study of the effect of Vitamin E on the vascular system of rats by Dr. Ira R. Telford, assistant professor of anatomy; and experimental vascular surgery in dogs by Drs. Blades, Smith and Charles Stanley White, trustee of the university.

University of Texas
Medical Branch

The Bacteriology Club of the Medical Branch gave a dinner February 17 in honor of Dr. Stuart Mudd, professor of bacteriology, in the University of Pennsylvania School of Medicine. Doctor Mudd described recent advances in microbiology as observed on a recent inspection of Soviet medical institutions. He also presented a formal discussion on the micro structure of bacteria as shown by the electron microscope. Dr. Honor B. Fell, director of the Strange Ways Laboratory, Cambridge, England, spent the week of February 17 inspecting the research studies in the Tissue Culture Laboratory under the direction of Dr. Charles M. Pomerat. Doctor Fell also participated in developing special tissue culture techniques for the *in vitro* study of cellular enzyme and growth systems. Dr. James B. Conant, president of Harvard University, delivered a special address to the staff and student body February 21st on "The Growing Relations of Chemistry and Medicine."

Dr. C. P. Rhodes, professor of pathology, Cornell University Medical College, and director of the Memorial Hospital for the Treatment of Cancer and Allied Diseases of New York City, and Dr. E. V. Cowdry, director of the Research Laboratories of the Barnard Free Skin and Cancer Hospital of St. Louis, were the special speakers in a symposium on growth phenomena and neoplasms on February 26th. Dr. R. L. Clark, Jr., director of the M. D. Anderson Hospital for Cancer Research, Houston, Dr. Charles Phillips and Dr. C. A. Stevenson of the Scott and White Clinic, Temple, also participated in the discussion.

Dr. Jacques P. Gray, dean of the University of Oklahoma School of Medicine, Oklahoma City, was the guest speaker at the 57th Graduation Exercises of the Medical Branch on February 14th.

The new John Sealy General Hospital, costing about $2,500,000 and providing 258 beds, is scheduled for the earliest construction that building conditions will permit. The new hospital

was made possible by a gift of $2,000,000 to the University of Texas by the Sealy and Smith Foundation of Galveston. This will increase considerably the clinical teaching facilities of the medical school.

The Alpha Kappa Chapter of the Phi Beta Pi Medical Fraternity at the University of Texas Medical Branch has established a Memorial Lectureship in honor of Arnold Charles Surman, a senior medical student who was killed at Post, Texas, in an airplane crash in the summer of 1946. The first lecture was given by Dr. George E. Burch, associate professor of medicine at Tulane University Medical School on March 4. Doctor Burch discussed "Salt and Water Balance in Cardiac Conditions" and gave a special clinic on cardiac diagnosis.

A special feature of the second Postgraduate Conference on Physical Medicine at the Medical Branch, arranged by Dr. Wilbur Selle, professor of physiology, was a symposium on rehabilitation. The discussion which was held on March 7th was participated in by Dr. Robert L. Bennett, professor of physical medicine, Emory University Medical School and director of physical medicine of the Warm Springs Foundation, Dr. Donald A. Covalt, assistant medical director of Medical Rehabilitation of the Veterans Administration, Dr. Richard Kovacs, professor of physical medicine, New York Polyclinic Medical School, Dr. George M. Piersol, professor of medicine of the Graduate School of Medicine of the University of Pennsylvania, and Dr. Arthur L. Watkins, chief of physical medicine of the Massachusetts General Hospital.

Dr. Frederick E Mohs of the University of Wisconsin Medical School gave a special demonstration of the chemosurgery of cancer on March 8th.

Dr. Lester Dragstedt, professor of surgery, University of Chicago School of Medicine, gave a special lecture on March 13th under the auspices of the Phi Chi Medical Fraternity.

A special grant of $2,500 has been given by J. B. Roerig and Company of Chicago for the support of research studies of the Tissue Culture Laboratory under the director, Dr. Charles M. Pomerat.

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University of Wisconsin
Medical School

Dr. Henry D. Bouman has been appointed associate professor and head of the department of physical medicine. Dr. and Mrs. Wm. J. Bleckwenn have established a memorial fund for their late son, William J. Bleckwenn, Jr., who died suddenly February 12, 1947, following a short illness. He was a junior medical student. Dr. Bleckwenn is professor of neuropsychiatry. Contributions to the fund should be sent to the dean of the school.

Dr. Chauncey D. Leake, vice president and dean of the University of Texas Medical Branch, a former member of the Wisconsin faculty, delivered the 20th annual William Snow Miller lecture, sponsored by the Phi Beta Pi Medical Fraternity, on March 18th. His subject was "Letheon: The Cadenced Story of Anesthesia." Dr. Leake was instrumental in establishing this lectureship while he was at Wisconsin.

An unusual and exceptional opportunity for study of the emotional, the psychological, and the psychiatric problems seen in pediatric practice is to be made available to pediatricians, psychiatrists and others who are directing their work into these areas, through the facilities of the Medical School and the Wisconsin State Board of Health. Dr. Benjamin Spock, formerly consultant in pediatric psychiatry to the New York City Health Department, staff member of the New York Hospital and Cornell University Medical College and now associated with the Mayo Clinic in Rochester as psychiatric consultant in pediatrics, and Dr. Milton Senn, assistant professor of clinical pediatrics (Psych.), Cornell University Medical College, New York City and Wisconsin medical graduate, will direct the work. The areas of study will include the normal and abnormal, and

will cover concepts of normal growth and development, the needs of the individual infant and child, common problems and deviants of the emotional growth, psychological difficulties attending physical illness, severe psychopathology, and the role of the general practitioner, pediatrician and psychiatrist in mental hygiene and psychiatric therapy. The periods of psychiatric development including infancy, the second year, two to three years, three to six years and six years to puberty, and the physician's relationship to parents, teachers and psychiatrist are covered in detail. Such details as the lying-in period, early feeding crises, thumb sucking, "spoiling," stuttering, foster care, nursery schools, sex interests, worries, compulsiveness, relationship between emotional and physical development, and toilet training will be considered from the standpoint of their practical implications.

This work is to be given at the medical school and the State of Wisconsin General Hospital in Madison and will extend from April 28 to May 18, 1947. Further details concerning this offering will be available through Dr. Llewellyn R. Cole, coordinator of graduate medical education, the Medical School, 418 North Randall Avenue, Madison 6, Wisconsin.

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Stanford University
School of Medicine

Dr. Chas. E. McLeman, of the University of Utah School of Medicine faculty, has been appointed professor and head of the department of obstetrics and gynecology. He succeeds Dr. Ludwig Emge, who resigned.

The Stanford Eye Bank has been established at Stanford University Hospitals, San Francisco, in order to provide for the blind and near blind of the West Coast area the same opportunity for recovery of vision through transplantation of the cornea which is available to residents of other parts of the country. This is accomplished by making available to eye surgeons qualified to perform the corneal grafting operation a dependable source of the necessary corneal tissue.

The work of the Stanford Eye Bank, initiated by gift funds to Stanford University, must depend for its continued success upon the good will of the public. The corneas collected and preserved by the Eye Bank are distributed without cost to the patient or surgeon except for a small service fee to cover the expense of handling the tissue.

The Eye Bank will act as a central registry where patients in need of corneal transplant operations are registered and where people willing to offer them their eye or the cornea therefrom can also be registered. This will provide a dependable source of corneas for grafting, promote interest in research leading to the improvement of methods of preserving corneal tissue, and encourage investigations improving the methods of the operation itself.

FACULTY PROMOTIONS: Wm. H. Northway, associate professor of medicine; Robert L. Bacon, assistant professor of anatomy; Wm. A. Bonner, assistant professor of chemistry.

To Clinical Professorships: Garnett Cheney, in medicine; Ann Peril Purdy, in pediatrics.

To Associate Clinical Professorships: John Wesley Cline and Robert Scarborough, in surgery.

To Assistant Clinical Professorships: Henry Dean Brainerd, in pediatrics; Ford Card, in medicine (neuropsychiatry); Chester L. Cooley, in obstetrics and gynecology; Francis Cox, in surgery (bone and joint); Frederick Fender, Frank Gerbode, Lot D. Howard and Frank Lusignan, in surgery; Willard M. Meininger, in medicine; Walter Work, in surgery (otorhinolaryngology).

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Louisiana State University
School of Medicine

NEW APPOINTMENTSS Dr. Jerome T. Syverton, formerly associate professor of bacteriology, University of Rochester, as professor and head of the department of microbiology. In the past, the depart-

ments of pathology and bacteriology have been combined. Dr. Syverton will be responsible for the organization of a new department which will cover instruction and research in the basic factors in infectious disease, including bacteriology, virology, parasitology and immunology. Dr. Curtis J. Lund, formerly associate professor of obstetrics and gynecology, University of Minnesota, as professor of obstetrics and gynecology on a full time basis. Dr. Harold L. Brauer, formerly instructor in pharmacology, Harvard University, as assistant professor of biochemistry, assigned to the department of pharmacology. Dr. Leon Churney, formerly instructor in physiology, University of Pennsylvania, as assistant professor of physiology. Dr. Allan L. Segal, formerly instructor in radiology, Columbia University, as clinical assistant professor of radiology. Dr. James A. Wilson, formerly resident in obstetrics and gynecology, Charity Hospital of Louisiana, as instructor in obstetrics and gynecology on a full time basis. Dr. Harry D. L. Kaye, formerly resident in surgery at the New Haven Hospital and assistant in surgery, Yale University, as instructor in surgery on a full time basis. Dr. Philip B. Johnson, recently released from military service, as instructor in medicine on a full time basis. Other recent appointments include Dr. Juan E. Morales as clinical assistant in neuropsychiatry, Dr. Marie L. Surgi as assistant in pediatrics, and Dr. Robert M. Rose as clinical assistant in orthopedics.

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Yale University
School of Medicine

The establishment next September of a graduate course in hospital administration, made possible by a grant from the W. K. Kellogg Foundation, is announced. The course will be an integral part of the teaching and research program in the Department of Public Health of the Yale School of Medicine. Clement C. Clay, M.D., newly appointed assistant professor of the Hospital Administration, will act as director of the Hospital Administration course. The program of instruction will include basic background subjects as well as those related specifically to management of hospitals. The total period of training will be at least 21 months, of which not less than nine months will be spent in residence at the university. Thereafter the student will become an administrative intern or resident in a hospital approved by the university for supervised practical training under an experienced administrator. Upon successful completion of the course, the student will be a candidate for a master's degree.

Three classes of students will be eligible for admission to the new course: Doctors of medicine, graduate nurses who have a bachelor's degree, and individuals who have a bachelor's degree without special training in medicine or nursing. Some practical experience in hospitals or medical care agencies is a prerequisite.

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Duke University
School of Medicine

PROMOTIONS: Dr. J. W. Beard, professor of surgery in charge of experimental surgery; Dr. N. F. Conant, professor of mycology and associate professor of bacteriology; Dr. W. J. Dann, professor of nutrition; Dr. C. E. Gardner, clinical professor of surgery; Dr. Leslie B. Hohman, professor of neuropsychiatry; Dr. W. H. Hollinshead, professor of anatomy; Dr. D. S. Martin, professor of public health and associate in medicine; Dr. Hans Neurath, professor of biophysical chemistry; Dr. J. W. Everett, associate professor of anatomy; Dr. Hans Lowenbach, associate professor of neuropsychiatry and associate professor of physiology; Dr. W. M. Nicholson, associate professor of medicine; Dr. E. L. Persons, director of student health, assistant professor of medicine, and associate professor of public health and preventive medicine; Dr. Ralph Arnold, assistant professor of otolaryngology and ophthalmology; Dr. Otto Billig, assistant professor of neuropsychiatry; Dr. K. L.

Duke, assistant professor of anatomy; Dr. Grant Taylor, assistant professor of bacteriology, assistant professor of pediatrics, and assistant dean; Dr. James G. Whildin, assistant professor of radiology. Dr. George F. Sutherland is visiting assistant professor of neuropsychiatry.

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Long Island
College of Medicine

Dr. Peyton Rous, member emeritus of the Rockefeller Institute for Medical Research, delivered the eleventh annual Adam M. Miller Memorial Lecture at the Long Island College of Medicine yesterday afternoon. The lecture was established in 1936 by the Phi Lambda Kappa Fraternity in honor of Dr. Adam M. Miller, former professor of anatomy and dean of the college. Its purpose is to present an annual lecture or series of lectures on some subject relating to the medical sciences to the undergraduate body, the faculty and the profession. Dr. Rous spoke on the subject of "Cancer as an End Product."

The college paid tribute to one of its graduates, Dr. Edwin G. Zabriskie, class of 1897, who was awarded the Alumni Achievement Medal. This award is given to a graduate of the college who has made an outstanding contribution to American medicine. Dr. Zabriskie, acting chief of services at the Neurological Institute of the Columbian Presbyterian Medical Center in Manhattan, was honored by the college on the 50th anniversary of his graduation.

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Washington University
School of Medicine

Dr. Robert A. Moore, who has been professor of pathology since 1939, and has served as acting dean for the past year, has been appointed dean.

Dr. Evarts A. Graham, professor of surgery, has been made an honorary member of the Belgian Society of Surgery and of the French Academy of Surgery.

A new course in hospital administration is announced. The director is Dr. Frank R. Bradley, professor of hospital administration and director of affiliated hospitals. The course is designed primarily for physicians—men and women. Nonmedical persons are also acceptable. The course covers a period of 21 months, of which 9 months are devoted to didactic instruction and 12 months to an administrative internship in an approved hospital. The tuition for the didactic course is $400; for the intern year, $200. The course is supported in part by a grant from the W. K. Kellogg Foundation.

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University of Colorado
School of Medicine

Dr. Ward A. Darley, dean, has been given the title of Director of the University of Colorado Medical Center, the new name for the schools of medicine and nursing, Colorado General Hospital and the Psychopathic Hospital. Dr. Darley's new title does not entail any new duties as he has been serving as the director of the schools and hospitals with the title as dean of the school of medicine, a position he will continue to hold.

Dr. H. J. Dodge, former director of public health at Coeur d'Alene, Idaho, has been appointed assistant professor of public health and preventive medicine.

To continue research on Colorado tick fever, Lederle Laboratories have renewed their grant of $2,400. These studies are made under the direction of Dr. Lloyd Florio, professor of public health and laboratory diagnosis.

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Meharry Medical College

Dr. William S. Quinland, who has been professor and head of the department of pathology at Meharry Medical College for the past twenty-five years, has resigned to accept an appointment, beginning July 1, in the department of medicine and surgery of the Veterans Administration, where he will serve in the capacity of Senior Grade Pathologist, at Tuskegee, Alabama.

Albany Medical College

Dr. Harold C. Wiggers has been appointed professor of physiology and pharmacology and head of the department, to succeed Dr. Harold E. Himwich who has resigned to accept another position. He will assume his new duties on July first next. Dr. Wiggers is now associate professor of physiology at the University of Illinois College of Medicine. He received his Ph.D. Degree from Western Reserve University in 1936.

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University of Nebraska
College of Medicine

At the Commencement held March 22, the honorary degree of Doctor of Science was conferred on Dr. Andrew C. Ivy, vice president of the University of Illinois in charge of the professional colleges, and Dr. Charles W. McCorkle Poynter, former professor and head of the department of anatomy and dean of the College of Medicine of the University of Nebraska.

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Georgetown University
School of Medicine

Dr. Andrew A. Marchetti, a member of the faculty of Cornell University Medical College, has been appointed professor and head of the department of obstetrics and gynecology.

Dr. Edward B. Tuohy of the Mayo Clinic has been appointed professor and director of the department of anesthesiology.

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Johns Hopkins University
School of Medicine

Dr. Edwards A. Park has been made emeritus professor of pediatrics. His successor is Francis F. Schwentker of the Rockefeller Institute for Medical Research.

Woman's Medical College
of Pennsylvania

The American Cancer Society has announced a grant of $3,570 to Dr. E. Frances Stilwell, associate professor of anatomy, as part of its allocation of $1,559,734 for expanded cancer research. Dr. Stilwell's research is being conducted on mitosis in relation to normal and neoplastic growth.

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Baylor University
College of Medicine

Baylor has set up a six months residency training program in the basic medical sciences beginning July 1, 1947. For details, the Dean should be consulted.

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College of Medical Evangelists

Dr. George Thomason, since 1914, professor and head of the department of surgery, died March 10th, aged 75.

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University of Oregon
Medical School

Dr. Numan W. Karr, recently released from the Navy, has been appointed assistant professor of pharmacology.

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Volume I, J. A. A. M. Colls.

The Department of Welfare of the Commonwealth of Pennsylvania wishes to obtain a copy of Volume I of the Journal of the Association of American Medical Colleges. Anyone who has a copy and is willing to dispose of it, please contact Miss Mary M. Ross, Librarian, Department of Welfare, Commonwealth of Pennsylvania, O'Hara and Desoto Streets, Pittsburgh, Pennsylvania.

General News

Student Nurse Recruitment Program

The Board of Trustees of the American Hospital Association has initiated and is sponsoring nationally a Student Nurse Recruitment Program for the purpose of securing at least 45,000 students for the nation's 1,300 nursing schools in 1947. To get the program under way, the Association voted to spend $10,000 toward financing this campaign and has also requested nursing schools to contribute to its cost. The active assistance of the Advertising Council, Inc., has been pledged to this campaign. Other organizations and associations, representing consumers of nursing service, have been invited to endorse and assist the program.

A survey conducted by the American Hospital Association revealed that on February 15 approximately 33,572 hospital beds were closed, due primarily to shortage of nurses. This situation is further aggravated by the fact that hospitals throughout the country report growing waiting lists for admissions for care and treatment of non-emergency conditions. Contributing to the shortages of trained nursing personnel have been the increased demand for hospital care and the trend toward the shorter work day and the shorter work week. These facts serve to illustrate that, unless nursing school quotas are reached, this grave situation confronting the nation's health today will be magnified many times within the next few years if sufficient numbers of registered nurses are not available to meet nursing needs.

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Scholarships for Rural Medicine

The Indiana State Medical Association is offering six or more scholarships each year for young men and women who wish to study medicine and practice in Indiana. Students who accept the scholarships must agree to be available for private practice in those counties "in which, in the opinion of the committee, medical service is most urgently needed." Principal cost of the scholarships will be borne out of funds appropriated by the council of the association. The scholarship committee is also authorized to accept donations from other sources. The medical association hopes thus to help meet the shortage of physicians in rural areas of the state. Dr. Alfred Ellison, South Bend, is chairman of the medical association council.

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Research in Heart Disease

More than a half million dollars for research in heart disease will go out to United States and Canadian colleges, hospitals and students from the Life Insurance Medical Research Fund in 1947. The 1947 allocations raise the total of all funds granted by the organization since 1945 to well over the million dollar mark. Forty-eight separate grants-in-aid, 13 postgraduate fellowships and one student fellowship were listed in the Fund's announcement. All of the research and study being sponsored was confined to problems in diseases of the heart and arteries, which in the United States is now the most prevalent cause of death.

Supported by 148 legal reserve life insurance companies in the United States and Canada, representing 93 per cent of the life insurance in force in the United States, the Medical Research Fund is administered through a board of directors comprised of leading life insurance executives and an advisory council of medical research experts. Scientific director of the Fund is Dr. Francis R. Dieuaide, clinical professor of medicine on the staff of the College of Physicians and Surgeons of Columbia University.

Grants-in-aid, ranging in value from several thousand dollars to more than

$30,000 and covering periods of research ranging from one to two and one-quarter years, were announced for 32 medical colleges and eight hospitals located in 19 states, the District of Columbia, and three Canadian provinces; the 14 fellows are from six states and two Canadian provinces.

Two types of fellowships are granted by the Fund, the senior fellowships to graduates who have a doctor's degree and student fellowships to undergraduate students in medical schools who wish to take an extra year for training in scientific research. Both senior and junior awards are for work and study at approved institutions under specified supervisors, and range in value from $1,500 to approximately $4,000.

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Mott Foundation Grant for Graduate Study

The Mott Foundation has made a grant of $2,400 for the graduate study program of pediatrics and communicable diseases at the University of Michigan, Ann Arbor, to be used by a physician who will go to the Flint School Health Program after two years' study. The Mott Foundation, which was established several years ago by Mr. Charles S. Mott, Flint, vice president, General Motors Corporation, sponsors various educational projects and outdoor activities.

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Foundation for Research on Hypertension

A gift of $1,000,000 to Beth Israel Hospital for a new foundation for medical research on hypertension has been established by Mr. and Mrs. Joseph Levy and will be known as the "Joseph and Helen Yeamans Levy Foundation, established in memory of their daughter, Miriam Levy Finn." Dr. Arthur M. Fishberg, Beth Israel physician in chief and director of medical service, will serve the foundation as director. One objective of the foundation will be to furnish opportunities to young physicians and scientists.

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Oklahoma Medical Research Foundation

With interest in obtaining funds to carry on medical research in Oklahoma, the Oklahoma Medical Research Foundation has been chartered and is conducting a public education program throughout the major centers of the state. An organized fund raising movement with a $1,500,000 minimum goal will be initiated this spring.

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The Williams & Wilkins Company

The Williams & Wilkins Company, medical publishers of Baltimore, Maryland, announce the association with their firm of Dr. F. Kenneth Albrecht who joined their editorial department in February on a full time basis. Dr. Albrecht was graduated from St. Louis University Medical School in 1939 and has been associated with the U. S. Public Health Service.

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University of Tennessee College of Medicine

At the request of local specialists, the college recently offered postgraduate courses covering the pathology of the eye, ear, nose and throat, and of the genito-urinary tract. The college was fortunate to have the services of Colonel James Earl Ash, M.C., U.S.A., Ret., Scientific Director of the American Registry of Pathology and former director of the Army Institute of Pathology. Each course consisted of a series of lectures, followed by the study of selected pathological specimens.

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Research Fellowships in Medicine

The Committee on Fellowships and Awards of the American College of Physicians has awarded five additional research fellowships in medicine for the year which begins July 1, 1947.

Book News

A Synopsis of Surgical Anatomy

By Alexander Lee McGregor, M.Ch., F.R.C.S., Lecturer on Surgical Anatomy, University of Witwatersrand, South Africa. With a foreword by Sir Harold J. Stiles, F.R.C.S. Ed. 6. The Williams & Wilkins Company, Baltimore. 1946. Price, $6.50.

An excellent book for the student; of convenient size; well illustrated (700 illustrations); concise yet complete. Of course, it has been brought up to date in the rewriting.

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An Introduction to Biological Chemistry

By C. G. Anderson, Ph.D., University of Edinburgh. Ed. 2. The Williams & Wilkins Company, Baltimore. 1946. Price, $5.

Chemotherapy comes in for a good share of attention since it involves the chemistry of metabolic processes. A chapter on antibiotics has also been added and a new presentation is made of the facts known about growth factors.

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Synopsis of Operative Surgery

By H. E. Mobley, M.D., Chief of Surgery at St. Anthony's Hospital, Morrilton, Arkansas. Ed. 2. The C. V. Mosby Company, St. Louis. 1947. Price, $6.

If operative surgery is included in the curriculum which a student must follow, this book will be found to be very useful. It is well written, well illustrated; concise yet complete.

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Urotubal Insufflation

By I. C. Rubin, M.D., Clinical Professor of Gynecology, College of Physicians and Surgeons, Columbia University. The C. V. Mosby Company, St. Louis. 1947. Price, $10.

Describes in detail, aided materially by many fine illustrations, a clinical diagnostic method of determining the tubal factor in sterility, including therapeutic aspects and comparative notes on hysterosalpingography.

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Practical Anaesthetics

By J. Ross Mackenzie, M.D., Lecturer on Anesthetics, University of Aberdeen; Senior Anesthetist, Royal Infirmary, Aberdeen. With a foreword by W. G. Wilson, M.B., Regius Professor of Surgery, University of Aberdeen. Bailliere, Tindall and Cox, London. Price, $3.

Fundamentals of Clinical Neurology

By H. Houston Merritt, M.D., Professor of Clinical Neurology; Fred A. Mettler, M.D., Associate Professor of Anatomy, and Tracy Jackson Putnam, M.D., Professor of Neurology and Neurological Surgery, Columbia University College of Physicians and Surgeons. The Blakiston Company, Philadelphia. 1947. Price, $6.

The various problems of diseases of the nervous system—now very much neglected since the growth of psychiatry—are discussed. A modern practical technic for examination of the patient is presented. The importance of a good knowledge of anatomy of the nervous system is stressed and the reasons therefor given. Medical students will do well to have a copy of this book.

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Therapeutic Exercise

By F. H. Ewarhardt, M.D., Assistant Professor of Physical Medicine, Washington University School of Medicine, and Gertrude F. Riddle, R.N., Instructor, St. Louis University School of Medicine. Lea & Febiger, Philadelphia. 1947. Price, $2.50.

A manual for students in physical education, occupational therapy and physical therapy. Concise and comprehensive based on the author's teaching experience. Considerable space is devoted to the classification and general characteristics of muscular action. In separate chapters are discussed analysis of joint motion; muscles participation in joint movement; physiology of therapeutic exercise with special applications in medicine, especially poliomyelitis and spastic paralysis.

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Principles and Practice of Obstetrics

By Joseph B. DeLee, M.D., Late Professor of Obstetrics and Gynecology, University of Chicago, and J. P. Greenhill, M.D., Professor of Gynecology, Cook County Graduate School of Medicine. Ed. 9. W. B. Saunders Company, Philadelphia. 1947. Price, $10.

Completely revised and many parts rewritten. Among the major changes is inclusion of additional material in the chapter on "Analgesia and Anesthesia," diseases of the blood and surgical operations; full discussion of the use of penicillin and the sulphonamides in the treatment of puerperal fever and other diseases. Unfortunately the endeavor to be all inclusive has maintained the large size of the book, but it is complete.

Bone and Bones:
Fundamentals of Bone Biology

By Joseph P. Weinmann, M.D., College of Dentistry, University of Illinois, and Harry Sicher, M.D., School of Dentistry, Loyola University. The C. V. Mosby Company, St. Louis. 1947. Price, $10.

An anatomist and a pathologist are the authors of this book, which is an attempt to eliminate the differences between the diverse viewpoints of those who, clinically and microscopically, roentgenologically and chemically, examine bone and bones and of those who experiment with bone and bones. It tries to bury the specters of "halisteresis" or "decalcification," "inteestitial growth of bone," "physical plasticity," and "creeping replacement," which are "resurrected again and again by the magic of the imagination." The book is intended to be a challenge to the research worker; a guide to those who work on bone and bones in their medical specialty; orthopedists, radiologists, metabolists, dentists, orthodontists; and an aid to the teacher who wants to integrate his particular field into the greater unit of biology. The authors distinguish between bone—a tissue, and bones—organs. Therefore, this is a most unusual book. It is well illustrated. It is evident that the literature bearing on the text has been culled well. The 30 pages of references, listing more than one thousand articles, must be complete or very nearly so, at least.

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Mental Mischief and Emotional Conflicts:
Psychiatry and Psychology in Plain English

By William S. Sadler, M.D., Consulting Psychiatrist, Columbia Hospital, Chicago. The C. V. Mosby Company, St. Louis. 1947. Price, $6.

While this book, apparently, is written for the layman, physicians will also find it informative. It is well written and easily comprehended. It is a good lesson in the principles of "wholesome living."

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Handbook of Correctional Psychology

Edited by Robert M. Lindner, Ph.D., and Robert V. Seliger, M.D., Philosophical Library, New York. 1947. Price, $10.

The intention of this book is to provide constant guidance to the prison physician, psychiatrist, psychologist, social worker, administrator and custodian and to point the way to better rehabilitation measures in institutions of detention and custody. The most competent and distinguished experts in this field have contributed the material to the book. Those interested in criminology and penology will find the book especially interesting. It is a monumental work.

The Head, Neck and Trunk
Muscles and Motor Points

By Daniel P. Quiring, Ph.D., Head of the Anatomy Division Cleveland Clinic Foundation and Professor of Biology Western Reserve University. Lea & Febiger, Philadelphia. 1947. Price, $2.50.

Portrays in diagrams and condensed descriptions the striated muscles of the regions mentioned in the title, giving an exact account of the skeletal attachments, nerve and chief arterial supply as well as functions. With few exceptions each muscle is shown in a single diagram.

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Obstetrical Practice

By Alfred C. Beck, M.D., Professor of Obstetrics and Gynecology, Long Island College of Medicine. Ed. 4. The Williams & Wilkins Company, Baltimore. 1947. Price, $7.

Bringing this book up to date keeps it in the front rank of popular student textbooks on obstetrics. The material on implantation and placenta formation has been rewritten and a new chapter on analgesia, amnesia and anesthesia has been added. The book is well and profusely illustrated by more than one thousand excellent drawings.

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The Pharmacopoeia of the
United States of America

Ed. 13. By authority of the United States Pharmacopoeial Convention. Prepared by the Committee of Revision and published by the Board of Trustees. Official from April 1, 1947. Printed and distributed by the Mack Printing Company, Easton, Pennsylvania. Price, $8.

The life line of medical practice.

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Bacteriology: Laboratory Directions
for Pharmacy Students

Compiled by Milan Novak, M.D., Professor and Head of the Department of Bacteriology and Public Health, and Esther Meyer, Ph.G., Ph.D., Assistant Professor of Bacteriology and Public Health, both of the University of Illinois College of Medicine, Dentistry and Pharmacy. Ed. 2. 1947. Price, $2.75.

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A Laboratory Manual of
Physiological Chemistry

By D. Wright Wilson, Benjamin Rush Professor of Physiological Chemistry, University of Pennsylvania. Ed. 6. The Williams & Wilkins Company, Baltimore. 1947. Price, $2.50.

Revised and brought up to date. A handy book for the student.

A Course in Practical Biochemistry

By A. T. Cameron, F.R.S.C., Professor of Biochemistry, and Frank D. White, Ph.D., Assistant Professor of Biochemistry, Faculty of Medicine, University of Manitoba. Ed. 5. The Macmillan Company, New York. 1947. Price, $3.50.

Medical students will like this book. It is of convenient size; well written and presenting essentials which he must know.

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Proceedings of the Conference on Preventive Medicine and Health Economics

Published by the School of Public Health, University of Michigan, Ann Arbor, Michigan.

This meeting was held September 30-October 4, 1946. It was attended by most, if not all, the members of the faculties of medical schools who are vitally interested in public health and preventive medicine. Henry F. Vaughan, Dr. P.H., Dean of the School of Public Health, University of Michigan, presided. The Conference was held with the hope that it would fulfill two purposes: (1) To define the field of preventive medicine; its relation to the whole of medical education and the methods and materials that might be utilized to integrate preventive medicine wth other subjects, and other subjects with preventive medicine in the medical curriculum. (2) To consider the developing field of health economics and the possible roles of professors of preventive medicine in research and in teaching health economics to medical students. Many excellent papers were contributed. The attendance was large.

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Recent Advances in Clinical Pathology

By various authors. Produced under the auspices of the European Association of Clinical Pathologists. General Editor: S. C. Dyke, F.R.C.P. (Lond.), with section editors on bacteriology, biochemistry, hematology and cytology, and histology. The Blakiston Company, Philadelphia. 1947. Price, $5.50.

The purpose of this book is to make available in the form of a symposium some of the more recent additions to the practice of clinical pathology which resulted from war experiences in Great Britain. Forty members of the Association responsible for this work contributed to various fields included in the text. The book must be commended. Medical students will find it useful in their work on the wards as well as in the laboratory.

BELL'S TEXT-BOOK OF PATHOLOGY

By E. T. BELL, M. D.
Professor of Pathology

CONTRIBUTORS

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Sixth edition, published 1947. Octavo, 910 pages with 500 illustrations and 4 colored plates. Cloth, $10.00.

This book is brief yet comprehensive, clear and definite, well written and well organized. It offers a complete review of the field of general pathology. The conclusions are painstaking and conservative and there is a sound practical approach to each concept not often obtained in more lengthy treatises. The references to the literature have been carefully selected, and the explanatory note after each will enable the reader to select those phases of the subject about which he desires more information. Here are definite ideas rather than wordy and indiscriminating records of opinions. This edition will uphold the high reputation of the work.

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